The OIL WEEKLY

OIL and GAS ENGINEERING

INTERNATIONAL AUTHORITY FOR THE PRODUCING AND PIPE LINE INDUSTRY

THE WEEK'S NEWS INTERPRETED

NOV 17 1944

State Capitol Building, Cheyenne, Wyoming

,813,000 BARRELS OF OIL PRODUCED BY WYOMING FIRST HALF OF 1944

he history of oil in Wyoming is rded as early as 1833, when seepages noted in the vicinity of Little Popo river. In 1847, the Mormons, on their ter trek to Salt Lake, discovered seep- near Hilliard, from which they pro- d oil to grease wagon axles, polish stocks, and for medicinal purposes. he first recorded commercial produc- ame in 1894, when the state produced barrels of crude oil. By 1912, the annual output had grown to 1,500,000 barrels, nearly all of which came from the Salt Creek field; this was encouraging enough to cause persistent exploration elsewhere.

Today, Wyoming is a major link in the chain of oil-producing states, producing 15,813,000 barrels of crude oil during the first six months of 1944.

We salute the Wyoming Oil Industry, and take pride in the part Hughes Tools have played in its development.

HUGHES TOOL COMPANY
HOUSTON, TEXAS

Cameron Equipment

PRESSURE OPERATED GATE VALVE—"FLEX-SEAL" MUD VALVES

Tames Another Wild One!

ACTION—Tense moments during the final stages of capping operations on Louisiana Central Lumber Co. Number 1.

Here is a picture of Louisiana Central Lumber Company No. 1, Caldwell Parish, Louisiana, which, from September 23 until October 5, was a wild gasser flowing an estimated 175-200 million cu. ft. daily.

Like scores of similar blowouts, this one was also successfully capped with a Cameron Pressure-Operated Master Gate Valve built into a specially designed manifold which included Cameron "Flex-Seal" Mud Valves. After closing the Pressure-Operated Valve, the well flow was diverted thru four 4" lines, the flowing pressure on which gauged approximately 1200 pounds p.s.i.

The fact that the Cameron Pressure-Operated Valve will withstand long periods of high pressure, abrasive flow across its seat and still effect a pressure-tight seal, and that it may be opened and closed at will with fluid pressure from a remote location, not only establishes it as the most effective means of controlling wild wells but also demonstrates its usefulness in drilling control manifolds to prevent blow-outs while pipe is out of the hole and thru the flowline.

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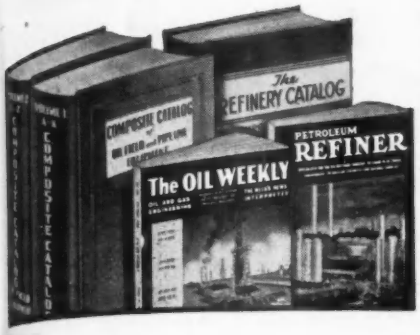

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☆

LOOKING AHEAD
... with the Editor

TAX matters are among the most complicated with which oil companies have to deal. The large companies are able to provide the necessary legal talent for coping with the problems, but not so always with smaller organizations or in the case of individual operators. These latter are frequently at a loss to know how best to get at a satisfactory solution of their tax difficulties.

Realizing the seriousness of this situation now, and also foreseeing its growing importance during the next few years when the whole subject of taxation will be uppermost in the minds of those having the responsibility for management of companies large and small, THE OIL WEEKLY will soon start a feature, "Tax Review," edited by William O. Taylor, an attorney associated with the firm of Butler and Binion, Houston.

Purpose of the review will be to review legislation, judicial decisions, administrative rulings and policies, topics or other matters of current interest to the oil industry from a tax viewpoint. The first such feature will appear in an early issue, and others will be published thereafter as frequently as developments seem to require.

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CENSORSHIP NOTICE—Censorship rules occasionally make it necessary to tear out or otherwise delete parts of publications destined to subscribers outside the United States. If there be such deletions in copies of THE OIL WEEKLY going abroad, they are at the request of the Office of Censorship. Copies sent abroad face unavoidable delay because of time necessarily consumed in passing the publication through the Office of Censorship.—*The Publisher.*

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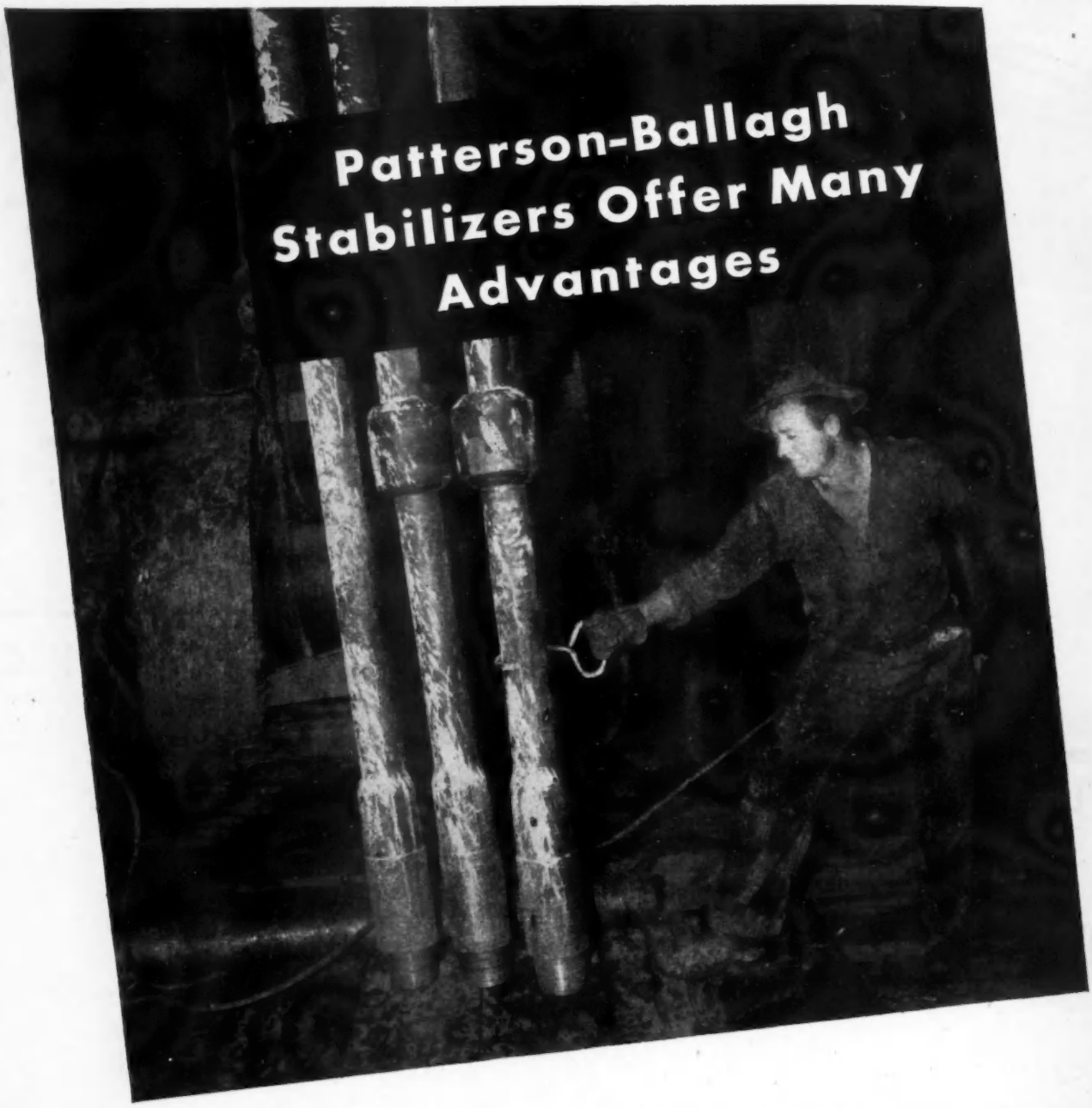

Increasing high speeds of drilling introduce certain problems when drilling in large casing. Considerable trouble often results from the "whip". To withstand these strains, manufacturers are supplying large diameter tool joints. Despite this change, wear on tool joints is extensive. Trouble is experienced with "twist-offs", and bent or broken drill pipe. In reaching high operating speeds, it is frequently necessary to pass through a "critical speed". The "whip" is so great in this speed zone that frequently there is not enough power available to pass through the zone, with the result that drilling cannot be done at high speeds.

Operators advise that in use these PATTERSON-BALLAGH STABILIZERS reduce sticking of drill pipe by "mudding" off walls, reducing the tendency to "key seat". Torque Gauge shows friction reduction up to 50%. Kinked joints are a thing of the past.

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The Changing Panorama

Company Spreads Christmas Spirit

"YOU may be sure that on Christmas we will be thinking of our Standard Oil people on the many battle fronts and in this country and wishing you everything good. We hope the contents of your gift package will please your appetite, give your appearance a lift, and provide entertainment for hours that might otherwise be dull."

This message has gone with Christmas packages to more than 3400 employes of Standard Oil Company of Indiana, overseas and in this country. The package includes fruit cake, candy, peanuts, shaving cream, razor blades, toothbrush, toothpaste and a deck of playing cards. On the back of each playing card is printed the greeting: "We're not forgetting our employes. Standard Oil Company (Indiana)." Women employes in the service receive the same package except that a box of toilet soap is substituted for shave items.

Letters of appreciation have already been received from New Guinea, Alaska and England.

Refreshers Help Veterans With Jobs

A ROUTINE that helps the ex-service man bring himself up to date on his company's activities and also to get back into civilian life, is a part of the plan of the General Electric Company in reemploying veterans. A "refresher" course is a part of the program to assist the returning employe to find his normal place in the company in the shortest possible time.

Applied to sales engineers it works this way: Ralph S. Fifield, a former salesman, was called to active duty in the Army in 1940. He was honorably discharged late in August of this year. Reporting back to General Electric, he was asked to go to Schenectady, there to start on a month's tour of the company's main apparatus factories. He traveled the standard route, from Schenectady to Pittsfield, River Works, West Lynn, Philadelphia, Schenectady, Erie, Fort Wayne, and back to his home base. When he had finished the course, he "bubbled over with enthusiasm for the new program."

This reaction was what the training committee had hoped for, because as a spokesman said, "The prime objective of this program is to provide returning service men with the necessary information, enthusiasm and confidence in themselves, their fellow employes and the company, which will enable them to do an outstanding job in whatever work they may be assigned."

Calls for End of Business Controls

LACK of a freedom of job opportunity is not going to set well with returning war veterans who have fought on the battlefields of the world to save "the American way of life," Henry Ford believes.

"The inspiration to work hard, to compete strongly with the other fellow in the same business," he said recently, "has almost been destroyed. Wartime controls that tie up raw materials, restrict production and limit the distribution of goods have got to be discontinued as rapidly as possible after the war if our American system of living and doing business is to be resumed."

Disciples who preach a doctrine of continued control over private enterprise are a menace to progress. "We had more than 150 years of the American way of life before we began to hear this kind of talk. It must be stopped now," Ford declared.

All our problems cannot be saddled on government or business, he warned. "A good portion of our trouble lies with those who work in the shops and factories of the country. Idleness is the reason for many of our troubles. My thoughts today are with the young men who are coming home from war with a blank wall of opportunity facing them. We owe these men, the ones who have been sent abroad, everything we can think of in the way of help and encouragement. They will want this help in the form of a chance to show what they can do—not in the form of a patronizing gift obtained by heavy taxes on their own families.

"What chance, under our present system, have these young men, should they want to express their individual ambition and spirit of invention, or their mere willingness to work hard at a good job? They must, according to current rules, get in line and wait their turn."

Many Voices Needed To Defeat Oil Pact

WITH election campaigns out of the way, Congress will go back to work. It faces great opportunities and many responsibilities. The first job will still be to promote the winning of the war, but it must also deal with many far-reaching reconversion, peace and postwar issues.

The oil business will be vitally interested in a number of these issues, but of most direct significance will be the Senate foreign relations committee hearings on the Anglo-American oil agreement. Many seem to feel that the Senate is unlikely to favor the Agreement. This is not a wise attitude to assume, for it is too early to get a clear indication of what action the Senate may take. The industry should present with clarity and force its views. And the more persons who speak up, the better it will be.

There appears to be almost unanimous opposition to the agreement within the industry, and many resolutions have been adopted by various oil associations and groups. Such activity should be continued, and at the same time oil men should be making a greater effort to inform other businesses that the oil agreement also is of vital concern to them. The oil agreement is the first attempt to carry out the "business principles" of the Atlantic Charter, and it undoubtedly establishes a pattern for the accords that will be drafted on many other commodities. If the essential commodities of the world are to be controlled by government-directed cartels after the war, with production, sales volumes and prices regulated, the very foundation of the American free enterprise competitive business will be destroyed. Some effort has been made to tell other industries of these facts, but greater impetus should be put on this phase of opposition to the pact. Now—before the first of these cartels is legalized by the Senate—is the time, and the only time, for all business to unite for the purpose of expressing its views on the subject of cartels. If the first attempt to establish government-directed cartels is ratified by the Senate, it will be that much easier to treat other commodities in a similar fashion. On the other hand, if the first attempt is defeated, similar attempts to control other commodities can be whipped with comparative ease.

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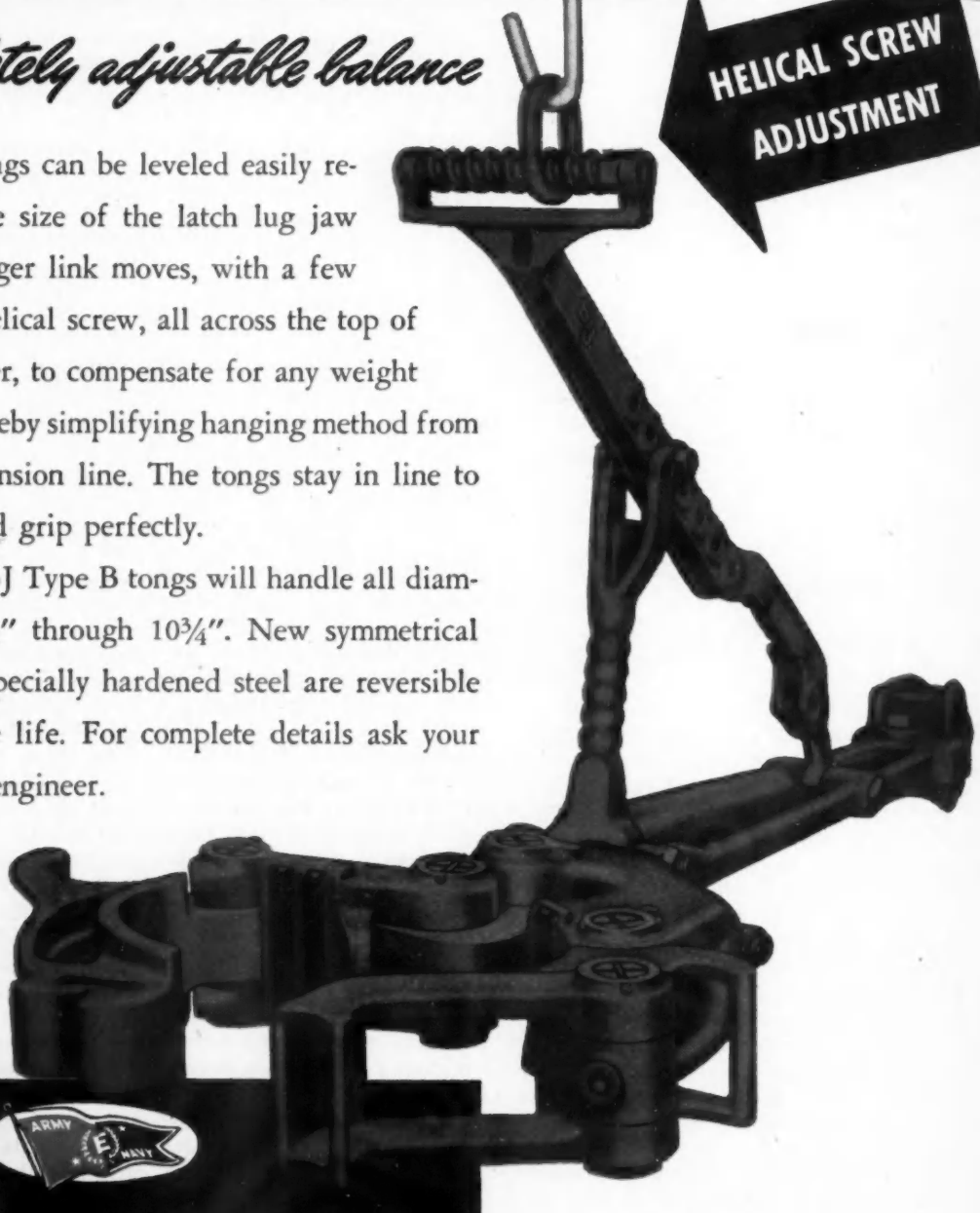
BJ Type B tongs can be leveled easily regardless of the size of the latch lug jaw used. The hanger link moves, with a few turns of the helical screw, all across the top of the tong hanger, to compensate for any weight difference, thereby simplifying hanging method from the tong suspension line. The tongs stay in line to latch easily and grip perfectly.

One set of BJ Type B tongs will handle all diameters from 3½" through 10¾". New symmetrical tong dies of specially hardened steel are reversible —doubling die life. For complete details ask your local BJ sales engineer.



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WASHINGTON ROUNDUP

By BERTRAM F. LINZ, Washington Correspondent

WITH all interests centered on the outcome of the political campaigns, Washington last week was a dry hole so far as major oil developments were concerned, but is expected to revive quickly now that the elections are out of the way and the administration is all set for another four-year drive.

There were, however, a number of minor developments of interest to the industry, including:

Sulphuric Acid Shortage—Disclosure that the sulphuric acid situation will be seriously critical during the next 60 days, with possibilities that it may be necessary to place the product under nation-wide allocation temporarily to insure adequate supplies for the oil industry and other essential users.

"Poxon" Plan Outlawed—Outlawed by the Supreme Court, the "Poxon" plan for splitting the tours of production employes was held to be an evasion of the wage and hour act.

Navy to Drill in Alaska—Navy Department plans for exploration of the possibilities of the Point Barrow reserve have been completed, and a working party will go to Alaska in January.

Emergency Pipe Line Program—PAW's big wartime pipe line construction program will be brought to completion shortly after the turn of the year.

Justice Department and Surplus—Disposition of government-owned rubber and other plants may run into difficulties by reason of a reported Justice Department policy opposed to the sale of such facilities to any company against which anti-trust actions are pending.

Election May Mean Full Speed Ahead On New Deal Postwar Conversion Plan

Re-election of President Roosevelt was seen by observers in Washington last week as all the encouragement needed by the administration to go full speed ahead with all the programs which have been blue-printed for the postwar conversion of our economy to a peacetime basis.

In oil-minded quarters it was pointed out that Governor Thomas E. Dewey, the Republican candidate, failed to carry a single one of the more important petroleum-producing states, although no significance was placed upon that fact. What another four years of New Deal government may mean for the oil industry is not immediately apparent, but it is already being suggested that postwar activities may include another effort to bring under government control oil activities of states which have failed to adopt conservation laws. Whether any effort will be made to control the oil industry generally will depend to considerable extent, it is believed, on whether Secretary of the Interior Harold L. Ickes remains in the cabinet.

Ickes, who devoted considerable time and energy to trips about the country in behalf of Roosevelt, submitted his resignation on to the President the day after the election, as he has twice before, in the event the chief executive desires to shuffle up his cabinet, but it is not expected it will be accepted.

Stiffer Attitude on Pact

The success of the democratic cause also is seen in Washington as possible presaging a stiffer attitude on the highly controversial Anglo-American oil agreement, which Ickes succeeded last month in having side-tracked as a campaign issue and on which, heretofore, the State Department has indicated a willingness to meet industry demands for changes.

In one important respect, the election will have an impact on the industry, for it is believed the administration will go through with its "trust busting" campaign and press the oil and other cases which have been suspended during the war at the request of the military authorities.

Ickes Is Satisfied With Oil Agreement

Holding his first press conference since before the last PIWC meeting, Administrator Ickes had nothing to say November 9 regarding the controversy over the Anglo-American oil agreement beyond comment that it would await the receipt of the "constructive suggestions" for revision which he had asked before determining his future course.

Ickes said he is "perfectly satisfied" with the agreement as it stands "unless it can be demonstrated it could be improved."

The administrator also said he had no comment on the Iranian situation resulting from the refusal of that government to grant Russia oil concessions which had been sought, but with respect to Ploesti he had no information but has been and is still trying to get some.

As the nation goes into the next four-year administration, the oil industry faces a number of problems in the solution of which the political leanings and economic beliefs of the top government officials will be a major factor.

In addition to the Anglo-American agreement, conversation and anti-trust prosecutions, these problems include conversion of the oil industry to peacetime operation, the future of the synthetic rubber industry, disposition of government-owned plants and pipe lines, dispersal of the war-swollen tanker fleet, control of oil imports, and crude and product prices.

So far as Congress is concerned, there will be only a few changes in the make-up of the committees dealing with oil questions.

In the case of the House interstate commerce committee, which has been following the oil situation closely for the past ten years, none of the members most prominent in the consideration of oil legislation was defeated.

Chairman Clarence F. Lea of California, head of the oil sub-committee since the resignation of the former Representative Cole of Maryland, was returned, as were Representatives Lyle H. Boren of Oklahoma, Charles A. Wolverton of New Jersey, Pehr G. Holmes of Massachusetts, Oren Harris of Arkansas and Clarence J. Brown of Ohio. The only vacancy to be filled is the seat held by Congressman Martin J. Kennedy of New York.

Asks Cabinet Changes

There will be only three vacancies to fill on the Senate interstate commerce committee, the result of the defeat in the primaries of Senators Ellison D. Smith of South Carolina and D. Worth Clark of Idaho and the elevation of Senator Harry S. Truman of Missouri to the vice presidency.

The Washington Post sponsored a monster demonstration for President

Far-Reaching Research—From raw materials to the well, experimentation and studies are constantly conducted to determine how "Oilwell" Rods can be improved. Here is fatigue-testing of sucker-rod steel under Hydrogen-sulphide well conditions.

Precision Manufacture—These controlled fine-grain carbon and alloy steels are formed, heat-treated and machined by skilled "Oilwell" workmen using modern precision equipment. Heat-treatment starts in this huge pyrometer-controlled normalizing furnace where "Oilwell" Sucker Rods are normalized over their entire length in one heat.

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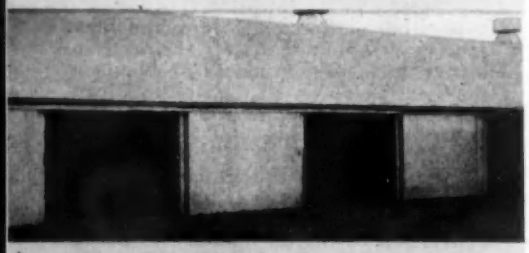

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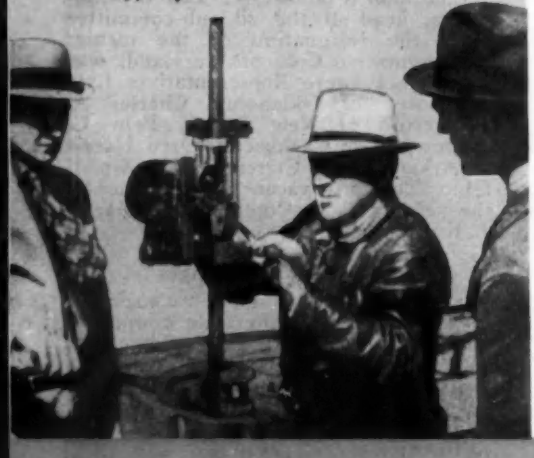

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Look at the illustrations on this page. These are a few of the important steps taken by "Oilwell" to assure best possible performance. If you need normalized carbon steel rods for ordinary service or fully heat-treated alloy steel rods for severe conditions, come to "Oilwell."

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Roosevelt when he returned to the capital November 10, and in a front-page letter to him the same day suggested the ousting of Jesse Jones, Secretary of Commerce, Federal Loan Administrator, etc. The Post suggested that since the President no longer has to think of the perpetuation of his own administration, he should, "clear out the deadwood." In addition to Jones, the paper suggested the replacement of Secretary of Labor Perkins and the transfer of Secretary Stimson from War to State, retiring Secretary Hull because of poor health.

Eugene Meyer, publisher of the Post, and Secretary Jones have been engaged for some years in a personal feud which had its most overt demonstration in a Washington hotel, when the cabinet member swung a haymaker at the newspaper owner.

Shortage of Sulphuric Acid Handicaps Industry

Stepping up of the Army's ordnance program, calling for increased production of smokeless powder and TNT, has created a serious shortage of sulphuric acid which may necessitate temporary extension to the rest of the country of the allocation program now in force in eleven Pacific coast and Rocky Mountain states.

War Production Board officials admitted November 9 that the next 60 days will comprise the critical period. New acid-production facilities are scheduled to come into operation within that period, although it was indicated that, even with the additional output, production will not equal demand until the ordnance program again slows down.

The latest figures available from WPB indicate that supplies of new and spent acid this year will fall more than 900,000 tons short of meeting requirements and during the first half of 1945 may be more than 400,000 tons under total needs.

The petroleum industry is the third largest consumer of sulphuric acid, its requirements being exceeded only by those for super-phosphates and chemicals, and it is expected to use 1,477,000 tons this year and 890,900 tons in the first six months of 1945.

Some 600,000 tons of additional annual capacity are expected to come into operation before the end of next March, and will pose a problem in tank car supply, since representations are being made that up to 600 more tank cars will be urgently needed to move acid from the plants and also for use of the ordnance plants.

Light Naphtha Being Used In Autos to Be Rationed

Rationing of light naphthas will be inaugurated by the OPA November 20 in 15 mid-western states, in an effort to prevent the illegal use of the product as a motor fuel. The heavier industrial naphthas will remain free from rationing.

The states in which rationing will be adopted are North and South Dakota, Nebraska, Kansas, Oklahoma, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Ohio, Indiana Kentucky and Tennessee.

War Pipe Line Program Scheduled To Be Completed in Two Months

PAW's many-faceted pipe-line program will reach final completion within the next two months, it was indicated last week in reports of progress on projects now under way.

Construction of Utah Oil Refining Company's 112-mile, 6-inch crude line from Iles Dome Pool, Colorado, to Wamsutter, Wyoming, where it will connect with the line running to the company's Salt Lake City refinery, has been completed and oil is being pumped through by temporary units which have been installed pending receipt of new equipment now on order.

Scheduled for completion before the end of November is Stanolind Pipe Line Company project for 232 miles of 12-inch crude line from Elk Basin to Casper, Wyoming, now fully laid and ready to operate upon completion of two pump stations, and 31 miles of 12-inch line between Casper and Welch, Wyoming, about 10 miles of which has been laid.

Coming into operation next month will be Ohio Oil Company's 115-mile, 8-inch products line from Robinson, Illinois, to Indianapolis, on which, it was shown by the latest report to PAW, all pipe has been received and 73 miles string, 75 miles of right-of-way cleared, 60 miles of trench dug, 59 miles of pipe welded, and 52 miles laid and backfilled.

The largest project under way is that of providing outlets for crude from the Elk Hills naval reserve to refineries at Los Angeles. The improvements programmed along the existing line of General Petroleum Corporation of California have been completed with the exception of 10.42 miles of 6-inch line from Castiac Junction to Fremont Junction, for which the pipe is just arriving.

Union Oil Company of California has completed construction of a 9-mile, 8-inch line from the reserve to Midway, and crude is moving, and The Texas Company has acquired practically all the right-of-way for its 61-mile, 10-inch line from Elk Hills to the valley pipe line at Cottonwood Pass. This phase of the program will be the last to be completed, being scheduled for January.

Special Rules Are Asked For New Field in Texas

Eltex, Limited, has asked the Texas Railroad Commission to fix special rules for the new Spring field, Harris County. There is now only one producing well in the area which found eight feet of oil sand in the Cockfield.

The company asked for proration on 40-acre units, 75 percent acreage and 25 percent per well. The company asked for spacing according to the statewide rule, that is, one well on 40 acres located 330 feet from lease lines. They hope to drill another well later, on each unit, so that the field will be developed finally on a 20-acre basis.

The state land commissioner asked that proration be fixed on acreage and per well and 50 percent allocated on each factor. There are numerous small tracts in the area, some 200, but Eltex has leases with pooling agreements on 97 percent of these tracts.

London Sees Only Dim Hope for Pact

REPORTS from London indicate that the British government is none too optimistic over the chances of United States senatorial ratification of the Anglo-American oil agreement.

Based on the views of Washington correspondents, the outlook for the agreement, as it now stands, is considered dim in the English capital, where it is expected that, now the election is out of the way, the State Department may suggest reopening of the negotiations with a view to framing a pact which will be less objectionable to American oil interest.

E. G. McKeever Elected Pan American President

E. G. McKeever was named president of Pan American Petroleum & Transport Company and its subsidiaries at a meeting of the board of directors November 10.

McKeever, who will take office January 1, will succeed Dr. Robert E. Wilson, recently named chairman of the board and chief executive officer of Standard Oil Company of Indiana.

Dr. Wilson will become chairman of the board of Pan American and certain of its subsidiaries.

D. J. Smith will become president of Pan American Production Company, Pan American Pipe Line Company and Pan American Gas Company, with producing and pipe line properties in Texas and Louisiana; Pan American Refining Corporation, operating refineries in Texas City, Texas, and Baltimore, Maryland, and the Mexican Petroleum Corporation of Georgia, which operates a refinery at Savannah, Georgia. His headquarters will remain in New York City.

P. J. Sweeny, manager of the company's refinery at Texas City, will be made a vice president of the Pan American Refining Corporation.

E. R. Turner succeeds McKeever as first vice president of Pan American Production Company, Pan American Pipe Line Company and Pan American Gas Company, with headquarters in the Mellie Esperson Building, Houston.

Turner joined Pan American as general manager of the production and pipe line companies in 1935, was made a vice president in 1939, and upon the formation of the gas company in 1941 was also made vice president of that company.

Clayton Urges Giving Industry Full Benefit in Disposing of Surpluses

Declaring that the government's surpluses of war materials and property are a national asset of tremendous value, W. L. Clayton, surplus war property administrator, last week urged that they be disposed of in such a way as to give the country the full benefit of the additional goods which thus will be made available.

Clayton warned that while it is essential that the more than $100,000,000,000 worth of property which the government will hold at the close of the war be disposed of with minimum interference with private business, ways must be developed to move it quickly and completely into the hands of the people.

"The necessity to avoid market disruption does not mean that surpluses should be frozen until they rot, become obsolete, or their values are dissipated in storage charges," he said in a report to Mobilization Director James F. Byrnes. "No greater disservice could be done to the economy in general or to the taxpayer in particular than to fail to realize on the value and economic usefulness of surpluses, or to have them indefinitely and unproductively overhanging the market."

The many difficult problems involved in the disposition of surplus property in such a way as not to impede industrial conversion were emphasized in the report, and methods adopted to establish an orderly system of disposal were outlined.

"The guiding principle," Clayton explained, "has been to obtain the widest possible distribution of surplus property, at fair prices and in quantities small enough to give small purchasers equal opportunity to compete with larger purchasers, and make efficient use of commercial channels of trade so as to avoid the expense and administrative cumbersomeness of putting the government into the retail business, as well as the resultant government competition with private business."

Alien Custodian Offers Kansas Farm Under Lease

The Alien Property Custodian is offering for sale a farm of approximately 320 acres located near Millerton, Kansas, subject to recorded liens, encumbrances and other rights of record particularly an oil and gas lease to Sun Oil Company.

The property was seized by the APC in the course of its round-up of enemy-owned properties in this country.

Surplus Planes Sold

The Reconstruction Finance Corporation is disposing of numerous airplanes, declared as surplus by the Army, to civilians. Many of these planes are adaptable to the oil man's requirements. Sales are held every week in various localities where the planes are stored and where they can be inspected. Written bids are accepted and all opened in public. Lists of planes available, locations and information may be had from Reconstruction Finance Corporation, Attention: L. B. Glidden, manager, Cotton Exchange Building, Dallas 1, Texas.

Natural Gas Line from Hugoton Pool Planned

United Light & Power Company, Chicago, plans a $70,000,000 natural gas pipe line from the Hugtoton gas pool of Kansas and Oklahoma to cities in Iowa, Illinois, Wisconsin and Michigan, according to William G. Woolfolk, president. The project awaits approval of the SEC to liquidate and dissolve the American Light & Traction Company, subsidiary of United Light & Power Company.

Woolfolk declared that construction of the line is primarily to protect operating companies of the American Light system, which are to become independent organizations, and to better serve its consumers.

There is no natural gas reserve in Wisconsin and insufficient reserve in Michigan to provide for expansion. United Light engineers plan to deliver twice as much gas in a day as is now possible from a single line, utilizing extensive underground storage fields owned in Michigan. Woolfolk announced that the storage program, designed to meet needs at peak periods of consumption, would constitute a new departure in the field of gas engineering and transportation.

If the liquidation plan is approved, American Light's gas distributing subsidiaries in Detroit, Milwaukee and Madison, Wisconsin, would become independent and would own and operate the proposed pipe line. Necessary steps include merger of the Milwaukee Solvay Coke Company and Milwaukee Gas Light and Madison Gas & Electric Company, and the sale of certain other assets. The Solvay Coke Company would continue its business when natural gas is introduced in Wisconsin.

Meantime, extensive development is under way in the Hugoton gas pool with Phillips Petroleum Company drilling 50 wells, several of which have been completed. Phillips and other operators in the pool are expected to tie into the proposed line.

Justice Anti-Trust Suits May Block Disposal of Synthetic Rubber Plants

Transfer of the synthetic rubber industry from government to private ownership may be handicapped by a policy said last week to have been adopted by the Department of Justice of objecting to the sale of any government-owned war plant to any concern against which actions are pending under the Sherman or Clayton anti-trust acts.

The department's policy was said to go so far as to apply to sales of surplus plants to companies which may be under investigation at the time, on the ground that the acquisition of the property might serve to extend monopolistic trends already under scrutiny as not in the public interest.

Under the surplus property act signed by President Roosevelt last month, the Department of Justice is empowered to review all dispositions of surplus plants costing the government $1,000,000 or more, and department officials were represented as prepared to exercise that power to the fullest extent possible in an effort to avoid surplus war plants from being used to foster monopoly or restrain trade, either by their operation or by their closing.

The department's policy was seen as having considerable influence upon the disposition of the war-born synthetic rubber industry since many of the potential purchasers of rubber plants are companies which are or have been involved in anti-trust actions.

Mexican Production and Import Figures Released

The value of Mexico's gasoline imports has been ten times that of its exports, according to a survey by the Mexican Ministry of National Economy.

The study covers petroleum production in 1939-43 and reveals that Mexico shipped only 500,000 pesos worth of gasoline abroad in 1943 against 5,000,000 pesos worth purchased the same year from other countries. This apparently anomalous situation is explained by government spokesmen on the ground that nearly all the imported gasoline was of the high-octane type, which is not yet produced in Mexico.

Mexico's entire output during the five-year period totalled 6,358,223 cubic meters of crude petroleum and a similar amount of petroleum by-products. According to the Ministry's findings, the latter were produced in the following quantities (cubic meters): fuel oil, 3,014,315; crude gasoline, 1,487,794; refined gasoline, 753,864; stove gas, 697,076; crude kerosine, 330,793; asphalt, 123,977; refined kerosine, 77,616; lubricants, 42,716; refined paraffin, 15,240; crude paraffin, 1692; and miscellaneous, 51,339.

Navy Expects to Start Alaskan Well in April

Plans of the Navy Department for testing the potentialities of the Point Barrow reserve were said last week to have been completed, and a permanent camp has been constructed to serve as the base for a party which will go into the Alaskan reserve in January.

Drilling of the first well is expected to be started by April, and it is hoped to find substantial oil around the 2000-foot level.

The Navy also is understood to be making a survey of a possible pipe line between the reserve and Fairbanks, 500 miles distant, but has not yet reached a determination as to how the oil is to be moved once it reaches that point.

Production Operators Split-Day Plan For Wage Payment Outlawed by Court

Reversing a decision of the Tenth Circuit Court of Appeals, the Supreme Court on November 6 outlawed the "Poxon" or split-day plan, adopted by Helmerich & Payne, Inc., production operators, affirming contentions of the Wage-Hour Division of the Department of Labor that it violated the fair labor standards act of 1938.

Under the plan, prior to which certain of the company's employes worked eight, ten and twelve-hour daily "tours" at a specified wage for each tour, the company made new employment contracts which arbitrarily divided each regular tour into two parts for purposes of calculating and applying hourly wage rates. The first four hours of each eight-hour tour and the first five hours of each 10-hour or 12-hour tour were assigned a specified hourly "base" rate, the remaining hours in each tour being treated as overtime. The government charged that the regular and overtime hourly rates were calculated so as to insure that the total wages for each tour would continue the same as under the original contracts, thereby avoiding the necessity of increasing wages or decreasing hours of work as the statutory maximum work-week of 40 hours became effective. The company abandoned the plan before the case came to trial.

Murphy Delivers Opinion

"Only in the extremely unlikely case where an employe's tours totaled more than 80 hours in a week did he become entitled to any pay in addition to the regular tour wages that he would have received prior to the adoption of the split-day plan," it was pointed out by Associate Justice Murphy in delivering the court's opinion. "Until more than 80 hours had been worked the plan operated so that the employe could not be credited with more than 40 hours of 'regular' work, the remaining time being denominated 'overtime.' Hence, since the wages under the old system and under the split-day plan were identical, the original tour rates could be used as the simple method of computing wages for each day period. The actual and regular workweek was accordingly shorn of all significance."

The split-day plan, Justice Murphy declared, made no effort to base the regular rate upon the wages actually received or upon the hours worked, but instead provided for a fictitious regular rate consisting of a figure somewhat lower than the rate actually received, arbitrarily allocated to the first portion of each day's regular labor, the latter portion being designated overtime and calling for compensation at a rate one and one-half times the fictitious regular rate.

Statutory Policy

In its opinion, the court made clear the basis on which it would require the wage-hour act to be applied by employers.

"It is no answer that the artificial regular rate was a product of contract or that it was in excess of the statutory minimum," Justice Murphy said. "The act clearly contemplates the setting of the regular rate in a bona fide manner through wage negotiations between employer and employe, provided that the statutory minimum is respected. But this freedom of contract does not include the right to compute the regular rate in a wholly unrealistic and artificial manner so as to negate the statutory purposes. Even when wages exceed the minimum prescribed by Congress, the parties to the contract must respect the statutory policy of requiring the employer to pay one and one-half times the regular hourly rate for all hours actually worked in excess of 40. Any other conclusion in this case would exalt ingenuity over reality and would open the door to insidious disregard of the rights protected by the act."

Rocket Power Already in "Big Business" Class

With the Navy spending $100,000,000 a month for rockets, the Army asking for an appropriation of $150,000,000 for them, and millions being spent in the development of jet propulsion engines and airplanes, the world can no longer look upon rocket power as a dream for the future. It is already a big business, the Harvard Engineering Society and the Harvard Club of New York were told by G. Edward Pendray, assistant to the president of the Westinghouse Electric and Manufacturing Company and secretary of the American Rocket Society.

"New postwar industries will spring from this enormous wartime development of rockets, rocket motors, jet propulsion engines and gas turbines," Pendray said. "The size of the new industries will depend largely on the progress our engineers and scientists are able to make during the remainder of the war.

"The effect on us, as civilians, will be enormous. Jet propulsion and rocket power will provide new altitudes and new velocities for flight, new power for aircraft, and new devices as important and revolutionary to human life as the invention of the airplane itself."

Eventually, he said, rocket power may enable engineers to build a 1500-mile-an-hour plane which can whisk a businessman from a New York breakfast to lunch in London and back to the United States by nightfall. Such planes will fly in the stratosphere, and may be powered by a combination of gas turbines, thermal jet engines and true rocket motors.

New Well Permits

The Texas Railroad Commission last week issued permits for drilling 115 new wells in Texas. There were 37 in West Texas, 25 in Southwest Texas and 19 in North Texas. The Gulf Coast reported 15 locations. There were 10 from the Panhandle, seven from West Central Texas and two from East Central Texas.

Slight Gain Registered In Week's Production

In averaging 4,737,075 barrels daily for the week ended November 11, United States crude oil production, as reported to THE OIL WEEKLY, was 3000 barrels a day higher than in the previous week.

The small increase was the net result of minor gains in several states which slightly outweighed decreases of similar proportions in other states.

Kansas registered an increase to 266,000 daily from 260,250 the week before, and there were smaller increases in Illinois, Indiana, Kentucky, Mississippi. Decreases were recorded in California, Louisiana, Michigan, Montana, Oklahoma, Pennsylvania, Texas, Wyoming. New Mexico was unchanged.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Nov. 11	Nov. 4
Alabama	200	200
Arkansas	80,500	80,850
California	882,000	883,000
Colorado	9,250	9,300
Florida	50	50
Illinois	204,800	203,500
Indiana	13,300	13,100
Kansas	266,000	260,250
Kentucky	30,850	28,950
Louisiana	364,600	363,950
North Louisiana	73,300	73,300
South Louisiana	291,300	290,650
Michigan	46,550	48,200
Mississippi	51,500	49,300
Missouri	100	100
Montana	22,340	24,940
Nebraska	1,000	950
New Mexico	105,750	105,750
New York	13,650	13,350
Ohio	7,700	7,750
Oklahoma	359,400	360,000
Pennsylvania	38,050	38,250
Tennessee	35	35
Texas	2,132,350	2,132,800
Upper Gulf Coast	553,350	546,700
East Texas Field	367,950	369,400
Rest of Eastern Texas	144,600	146,700
Lower Gulf Coast	247,600	243,000
Southwest Texas	79,300	78,650
South Central Texas	20,150	19,950
West Texas	474,000	482,050
North Texas	151,200	150,200
Panhandle	94,200	96,150
West Virginia	8,650	8,650
Wyoming	98,450	100,850
Total United States	4,737,075	4,734,075

Twenty-Five Tankers Are Delivered During October

Operating at record levels, American shipyards delivered 25 tankers during October, it was reported last week by the Maritime Commission.

Seven of the tankers were for the Navy, the remaining 18 being "standard" tankers, deliveries by yards being as follows:

Alabama Dry Dock & Shipbuilding Company, Mobile, four; East Coast Shipyards, Inc., Bayonne, New Jersey, four (coastal); Marinship Corporation, Sausalito, California, two; Sun Shipbuilding & Dry Dock Company, Chester, Pennsylvania, six; Todd-Galveston Dry Docks, Inc., Galveston, Texas, two (coastal); Welding Shipyards, Inc., Norfolk, Virginia, one; Kaiser Company, Inc., Portland, Oregon, six.

Marsh Buggies Built from Junk Save Time, Money

Contractors find vehicle indispensable in laying pipe lines in swampy areas of Southern Louisiana

By TOM L. TURNER, Staff Writer

TIME, effort and money are saved with the marsh buggy, formerly used in geophysical and production work, by Sharman and Allen, Houston, construction firm engaged in laying pipe lines in the swampy areas of Southern Louisiana.

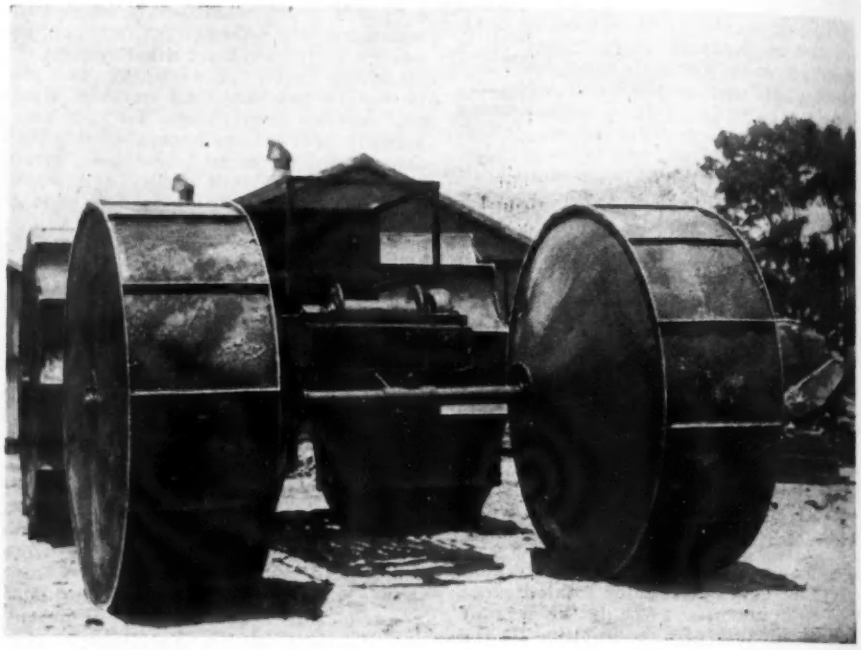
Built entirely of salvaged materials, the buggy is 10 feet wide, 22 feet long, and can easily carry a load of 2000 pounds. The pontoon-type front wheels, driven directly from the transmission of the power unit, furnish traction on both land and water. Steering is done by the rear wheels, also of the pontoon type.

Automobile Engine Used

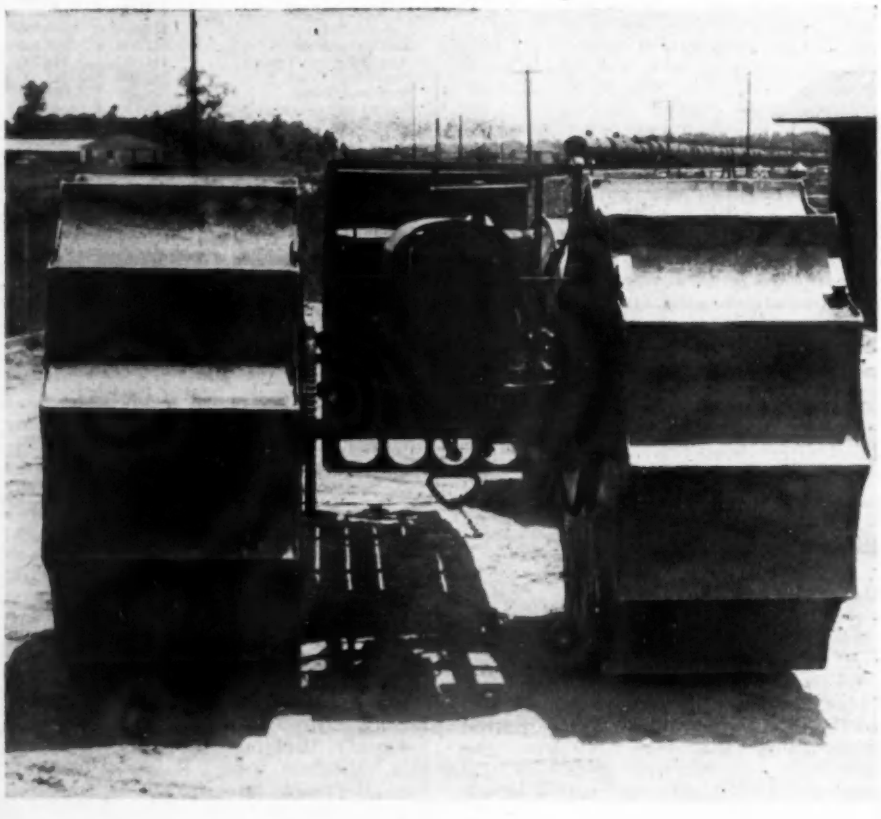
Because all weight saved in building the buggy means additional carrying capacity, particularly while in the water, circular sections of the frame were cut out in even patterns. Onto the frame was mounted a salvaged automobile gasoline engine and transmission. A specially constructed unit replaced the automobile differential, which includes sprockets from which roller chains drive the front wheels, and a manually-operated brake. A power takeoff was installed to drive a winch attached to the rear of the frame for moving heavy machinery and for towing.

Description of Wheels

The wheels furnish the buoyancy. The front wheels, which have wide, semi-circular grooves to furnish traction in marshland and water, are three feet wide by seven in diameter. The rear wheels, conical shaped on the inside to clear the buggy frame are three feet wide by six in diameter. A single shaft connecting the rear wheels is attached to the buggy frame at its center.



Above—Rear view of the buggy, showing conical shaped rear wheels and axle that steers buggy and also the winch that furnishes towing power.



Left—Front view of pipe line marsh buggy, showing pontoon-type front wheels, automobile engine and drive chains to front wheels. Hook on front of the frame is for towing purposes which often is necessary when buggy is navigating swift water. The circular holes reducing the weight of the frame can be seen below the radiator of the engine.

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Mississippi Conservation Laws

Acts passed before state had any oil-producing fields and are inadequate; administering fund low

By GEORGE O. IVES, Staff Writer

THERE is a definite need for revision and modernizing of the oil and gas conservation laws in some states in order that they will meet requirements of changing conditions, particularly the true conservation of natural resources.

For example, with the increasing importance of Mississippi as a source of oil and gas has come renewed concern regarding the adequacy of legislation delegating authority to its regulatory body. Statutes now in force were passed in 1932 and amended in 1934 and 1936, when the state had only gas production. Mississippi has been an important producer of oil since 1939 but no new provisions have been made in the law. The appropriation for expenses of regulation is entirely inadequate to maintain a sufficient force of trained technicians to render a real service either to the state or to operators. Recognition of these problems was made apparent in an attempt to pass a comprehensive oil and gas conservation law at the last session of the legislature. For a number of reasons the bill died in committee. So the old law still holds.

In considering the adequacy of the conservation statutes of any state it must be borne in mind that no state conservation agency can arbitrarily issue valid regulations or orders in excess of its delegated authority. After a number of years of legislative, administrative, and judicial history of conservation practice in various states it is apparent that the states are fully authorized to enact any legislation needed for preventing physical waste of oil and gas, to protect the correlative rights of producers, land, and royalty owners, and to limit or restrict production to current reasonable market demand in the public interest. It follows then that it is the duty of every state legislature to consider all phases of proposed conservation acts so as to make them as complete as possible to protect not only the public interest but also the equitable rights of oil operators. Important, too, is protection of regulatory body in the performance of its duties so that it is not subject to constant attack in the courts on matters which should be clearly within the scope of true conservation.

Optimum Rate Important

Most engineers believe that in order to obtain the maximum use of the reservoir energy for greatest ultimate recovery, it is necessary to produce from a field slowly, whatever be the type of energy. Therefore the rate of production, or more specifically, restriction of production to the so-called optimum rate of flow, is the most important step in any conservation program. Experience has shown that in general production should be restricted by market demand and by prevention of underground waste, whichever is lower.

The present Mississippi law was an act to provide machinery for the conservation of the oil and gas resources of the state, but it is colored by the circumstance that at the time of passage there were only two producing areas in the state, both being gas fields. The law was designed almost exclusively for regulation of gas production and development, and it was extended to include oil almost as an afterthought.

Introduction of Senate Bill 24 to supersede the old law was a forward step, the bill being patterned after the Arkansas conservation statutes. It was considered an act which would give the regulatory body all needed powers but even in its original form the bill failed to go all the way in delegating proper authority to the commission. It provided for integration of tracts into drilling units with forced unitization in the event operators could not voluntarily agree on pooling, but did not recognize the need for unitization of entire pools or portions thereof for operation of cycling and pressure maintenance projects to conserve reservoir energy and increase primary recoveries. The bill was revised considerably after introduction but the final draft of the committee substitute, with certain other revisions would, according to competent authorities, have been wholly adequate for modern regulation.

Deficiencies Cited

The fundamental weakness of the revised Mississippi bill was that it did not provide for any means of limiting the state's production to market demand, and that it did not provide for allocation of the state's total outlet among the various fields. No provision was made for limiting the production from any field below the maximum amount which it could produce without physical waste. The Arkansas law limits the field to the amount it can produce without waste, but also makes provision for restricting and prorating production should it be found necessary for the field output to be less than the actual optimum rate.

As originally introduced, the bill recognized that at times fields must be restricted in output below the optimum rate, and provided for proration and allocation on a reasonable basis, giving each operator the opportunity to produce that part of the oil or gas believed to be in place in the reservoir underlying his acreage. However, as revised by the committee, the commission would have authority to prorate production from each pool among the various wells and tracts, but is specifically prevented from limiting production from any field below that figure which is determined as being the most it can produce without waste. Other than actual waste in the reservoir, the only basis for restriction left to the commission was the inclusion, among definitions of waste, of a clause prohibiting inefficient storing of oil or operating or producing any oil or gas well in a manner tending to cause unnecessary or excessive surface loss or destruction of oil or gas. In other words, as long as a well or pool was not producing above its optimum rate, and as long as transportation and storage facilities could take care of the output, then the commission could not on any basis restrict its production. If any one field could produce enough oil to satisfy the entire market demand for the state, and establish its market first, there seemed no way the commission could apportion this demand among other fields.

On the other hand, the committee, in revising the original S.B. 24, inserted a section giving the most comprehensive coverage for gas and condensate operation to be found in any statute. The oil and gas commission would be empowered to take all necessary steps for determining whether it is feasible to institute cycling operations in any pool or portion of a pool within the state producing gas from which condensate may be separated or from which natural gasoline may be extracted. Wherever cycling is advisable the commission could promulgate rules for the regulation of the production and for reintroduction of the gas into the formation.

Goes Even Further

Both proposed acts provided the same protection from anti-trust laws in the event of voluntary pooling or unitization as is provided in the Arkansas law (THE OIL WEEKLY, October 16, 1944) but goes a step further in that it would require owners of tracts within a pool to integrate and develop their properties as a unit if deemed necessary for the conservation of reservoir energy and to insure the greatest possible ultimate recovery of hydrocarbon liquids from the reservoir. In case of dispute over costs of development and operation of such projects, the commission would apportion same.

This section (Section 15) also provided under subsection C for voluntary or required integration of oil-producing portions of pools suitable for gas cycling operations, to maintain reservoir pressure and conserve energy as a whole, with provisions that an oil-producing area could not produce, without returning to the reservoir, an amount in excess volumetrically of the amount of condensate and gas produced from the tracts producing gas, condensate, and natural gasoline only, and not returned to the formation from which produced.

Recognition of the nature of gas-condensate reservoirs was indicated by the provisions of subsection D of Section 15 of the committee substitute, where it was accepted that in efficient gas cycling operations it is not always feasible to produce gas from each and every lease or tract within the unitized pool, or to return an equivalent amount of gas to the same lease or tract following extraction of natural gasoline and condensate. This section provided that such gas may be returned to the common reservoir through input wells located on any lease or tract in the pool so long as such operations are not wasteful and do not lead to unequalized pressure conditions throughout the pool.

In inserting this section the senate

committee and its advisors accepted the findings of engineers trained by study and experience, that cycling operations in gas-condensate fields, and in oil fields where the principal reservoir energy is gas, either free gas or gas in solution with the oil, are the ultimate yet devised for real conservation. It recognized that merely restricting the output so that normally expected production might be extended over a longer period is not sufficient within itself. Particularly within this type of reservoir, much oil would be recoverable by primary production methods which would be forever lost if pressures were allowed to drop within the reservoir to cause excessive retrograde condensation.

Further examination of the bill as originally introduced in comparison with the senate committee substitute reveals several other instances in which provisions have been added or others cut out. It would seem that some of these changes would be for the better, while some would not. In general, the additions were constructive, while as a whole the portions cut out by the committee might better have been left in, particularly those dealing with the authority of the commission to limit the total amount of oil or gas produced within the state and allocation among the various pools within the state.

As originally introduced, the bill included among definitions of waste: "Producing oil or gas from any pool in excess of transportatiop or marketing facilities or reasonable market demand." This was struck out in preparing the substitute. In another section the substitute prohibited waste as defined in the act, and specifically added: "but there shall be no limitation upon the production of oil or gas except for the elimination and prevention of waste as herein defined."

The original bill, as well as the Arkansas law, provided authority "to limit and prorate the production of oil or gas or both from any pool or field for the prevention of waste as herein defined." This provision was not included in the substitute but the substitute did carry a similar provision reading: "If necessary for the prevention of waste as herein defined to determine the maximum amount of oil or gas or both that can be produced from any pool in the state." This would appear to be materially the same as in the original except that it was obviously designed to emphasize the commission's lack of authority to reduce production below the maximum that could be produced without waste, inasmuch as market demand and transportation factors were excluded from the definitions of waste.

No Limit on Drilling Units

Another evidence of the obvious intent to preclude restriction of production is found in the fact that in Section 13 of the substitute, the committee had eliminated the opening words of the section which originally read: "Whether or not the total production from a pool be limited or prorated," and had also eliminated in subsection D the word "authorized" speaking of production. Also struck out were the words: "whether it be the total which could have been produced without any restriction in the amount of production, or whether it be an amount less than that which the pool could produce if no restriction on amount were imposed."

In Section 14 of the senate substitute dealing with the required integration of separate tracts into drilling units, the clause was added that in the event of a dry hole on such a unit, no cost should attach to the operator whose tracts were integrated by the commission.

The Mississippi bill also made no provision for limiting the size of drilling units, either in the original or substitute. Arkansas limits oil units to 40 acres, with additional 10-acre tolerance.

Provisions were made in the substitute for authority to prevent wells being drilled, operated, or produced so as to injure neighboring leases or property. Other provisions called for ratable takings in all pools on a reasonable and equitable basis, and for submission of monthly production reports to the commission and to the state tax department. None of these were specifically contained in the Arkansas law or in the original S.B. 24, but seem to be good provisions. The committee also saw fit to include a definition of a discovery well as being a well capable of producing oil or gas located at least two miles from the nearest producing well, or producing from a new pool. In this connection, the oil and gas commission was given no discretion with reference to granting a permit for drilling a wildcat well, but would be required to grant such permits upon payment of the required $50 fee by the operator.

One addition to the authority of the commission which might have been construed as objectionable to operators in its final form, was the requirement that operators submit records on all wells, including test wells, and must submit "electrical and/or other logs." Some operators of wildcat wells might desire to withhold such records as electric logs until such time as they have had full opportunity to explore a prospect.

The following is an excerpt from the committee substitute for Senate Bill 24, introduced at the regular 1944 session of the Mississippi Legislature, being Section 15 dealing with regulation of cycling operations:

Section 15.

(a) For the prevention of waste and to avoid the drilling of unnecessary wells, the commission shall, after notice and upon hearing, determine the feasibility of cycling gas in any pool or portion of a pool productive of gas from which condensate may be separated or natural gasoline extracted, and promulgate rules to regulate production of the gas and reintroduction of the gas into productive formations after separation of condensate and extraction of natural gasoline from such gas.

(b) When two or more separately owned tracts of land are embraced within a pool or portion of a pool suitable for gas cycling, the owners thereof may validly agree to integrate their interests therein and develop their lands as a unit. Where, however, such owners have not agreed to integrate their said interests, the commission may, if necessary to prevent waste and to avoid the risk involved in the drilling of unnecessary wells, require such owners to integrate their said interests and to develop their lands as a unit. All orders requiring such integrating shall be made after notice and hearing, and shall be upon terms and conditions that are just and reasonable, and which will afford to the owner of each tract the opportunity to recover or receive his just and equitable share of the gas condensate or natural gasoline in the pool or portion of the pool without unnecessary expense. The portion of the production allocable to each tract in a unit formed by an integrating order shall, when produced, be considered as if it had been produced from such tract by a well drilled therein. In the event such integrating is ordered by the commission, the cost of development and operation of the integrated unit used as a basis for determining the portion of said cost chargeable by the operator to the other interested owner or owners shall be limited to the actual expenditures required for such purpose not in excess of what are reasonable, including a reasonable charge for supervision. In the event of any dispute relative to such costs, the commission shall determine the proper costs.

(c) In the event a portion of a pool suitable for gas cycling operations is productive of oil, the owners of oil-productive leases may validly agree to integrate their interests with owners of leases productive of gas, condensate and natural gasoline and operate their leases as a part of the gas-cycling unit, to help maintain reservoir pressure and conserve energy in the pool as a whole. Where, however, such owners of oil productive leases have not agreed to integrate their interests, the commission may, for the prevention of waste and to avoid the risks involved in the drilling of unnecessary wells, after proper notice and upon hearing, require such owners to integrate their said interests and to develop their lands as a part of the cycling unit operation. All orders requiring such integrating shall be upon terms and conditions that are just and reasonable, and which will afford the owner of each tract the opportunity to recover or receive his just and equitable share of the oil and gas in the pool without unnecessary expense, provided, however, the owner of an oil-productive tract shall not be permitted to produce without returning to the formation from which produced an amount of oil, gas and condensate per acre per day in excess volumetrically of the amount of condensate and gas produced per acre per day from the tracts producing gas, condensate and natural gasoline only and not returned to the formation from which produced. In the event such integrating is ordered by the commission, the cost of development and operation of the integrated unit used as a basis for determining the portion of said cost chargeable by the operator to the other interested owner or owners shall be limited to the actual expenditures required for such purposes not in excess of what are reasonable, including a reasonable charge for supervision. In the event of any dispute relative to such costs, the commission shall determine the proper costs.

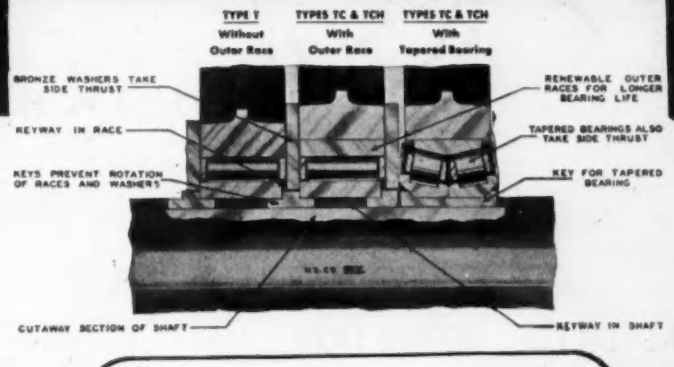
(d) To secure efficient gas cycling operations, it may not be feasible to produce gas from each and every lease or tract of land in a pool, in which cycling operations are conducted, or to return to each lease or tract of land therein, the quantity of gas equivalent to the gas remaining from that delivered from said lease or tract of land after the extraction of natural gasoline and the separation of condensate therefrom, and, in such event, gas which is produced from any leases or tracts of land in a common pool, may, after processing in cycling plant, or plants, be returned to productive formation through input wells located on any lease or tract of land in such a pool, provided, such operations are not wasteful and do not lead to unequalized pressure conditions throughout said pool.

TRAVELING BLOCKS
low friction and maintenance

GENERAL SPECIFICATIONS

Rated Capacity, tons	300
Sheaves, diameter	48"
*Sheaves, API Groove, Size Line	1¼"
Upper Pin, diameter	3½"
Center Pin, diameter	10¼"
Lower Pin, diameter	7½"
Clevis Pins, diameter	4½"
Clevis, Depth and Width	11"x6"
Side Plates, Distance Across and Length	51"x88½"
Width Overall	34"
Length Overall, 548-T & 548-TC	9' 8"
Length Overall, 548-TCH	8' 0"
Net Weight, 548-T, pounds	11,251
Net Weight, 548-TC, pounds	11,928
Net Weight, 548-TCH, pounds	10,928

*These sheaves can be grooved for 1¼" line when desired.



Note that very little disassembling is necessary to remove the Sheaves from the Center Pin

The National Supply Company

Executive Offices: Pittsburgh, Pa.

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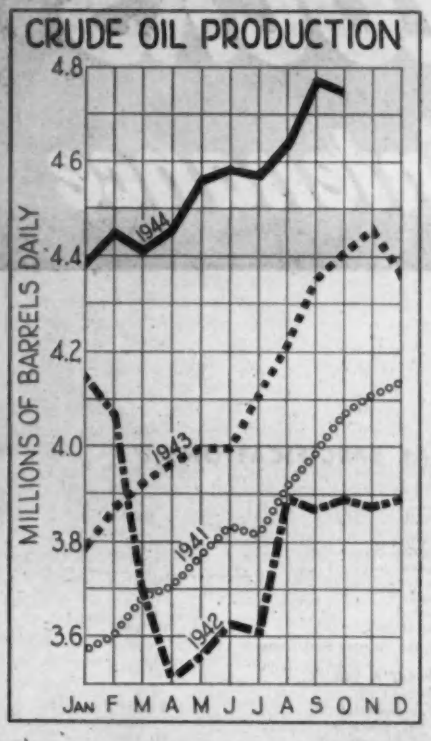
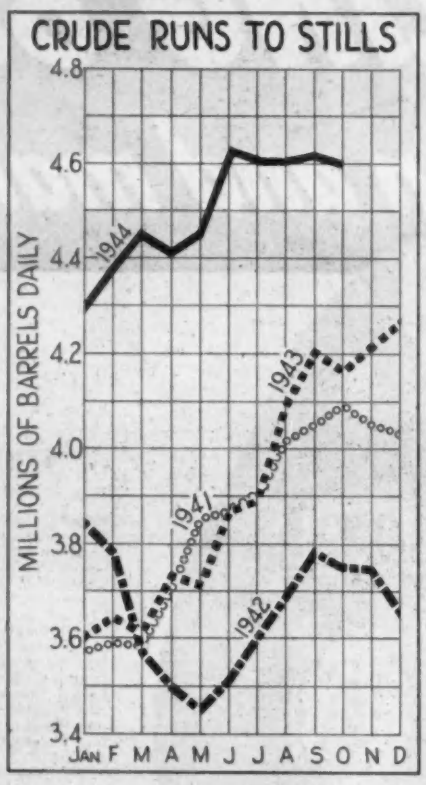
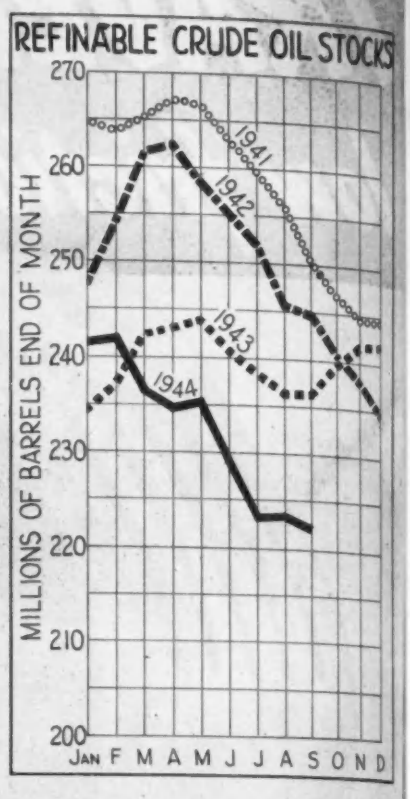
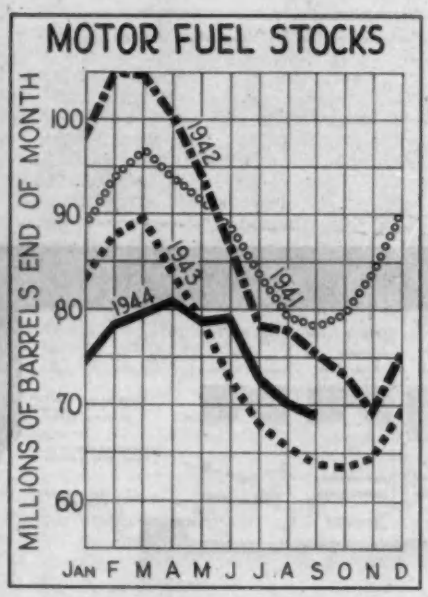
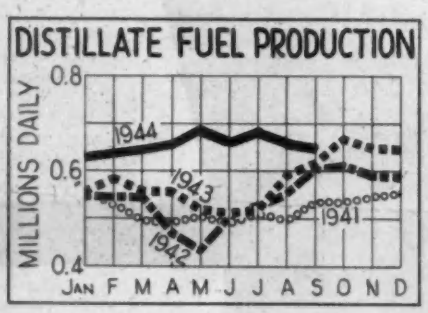
Monthly Activity Trends

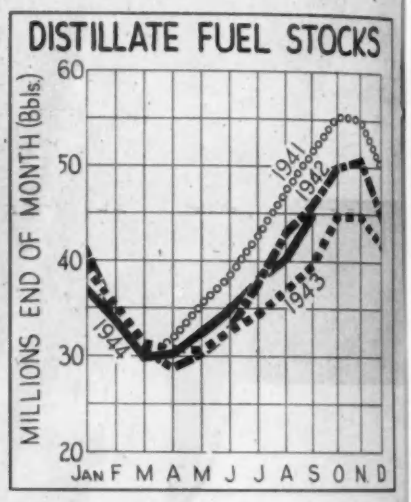


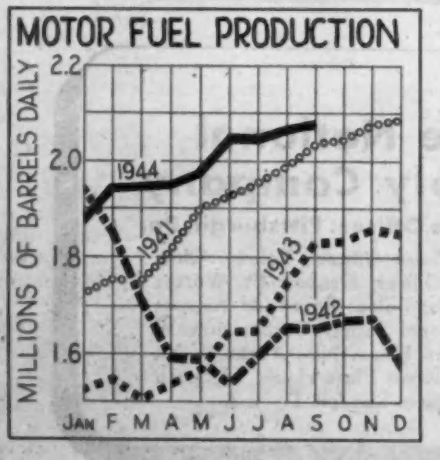


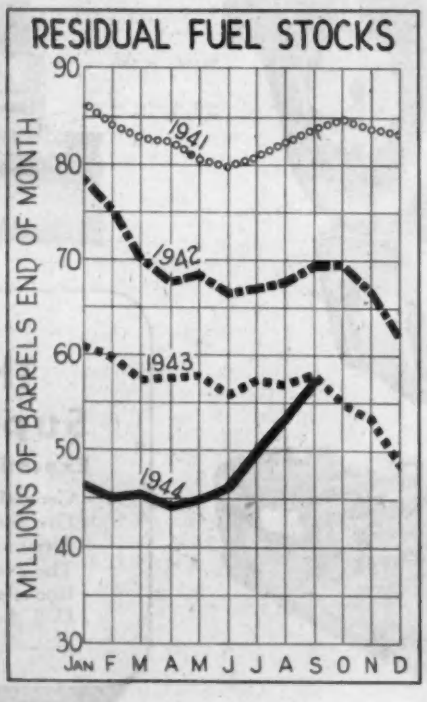


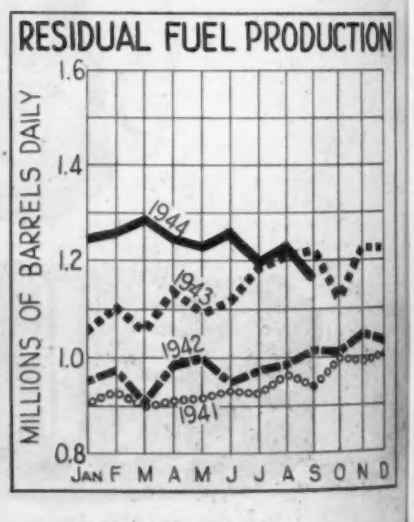












Leveling of Demand Relieves Strain in Supplying Oils

Crude production and runs to stills flatten out after climbing to war time peaks, but with demand tapering off, supplies meet needs and improve stocks position

By J. L. LOGAN, Associate Editor

FOLLOWING the critical period of several months after invasion of western Europe, there has been some easing of the strain on the oil industry in meeting the unprecedented requirements of crude oil and products. This improvement of the industry's situation has been based primarily on the recent stepping up of supplies made available to the United Nations from the Caribbean area, where both producing and refining capacity have been expanded.

Through benefit of increased supplies of foreign oils, there has been possible a slight cut-back and subsequent leveling out of domestic crude production and domestic crude runs to stills. Previously, in the several months after D-Day, United States crude production was pushed up to an all-time high, and numerous fields of the country were being produced at rates in excess of maximum efficient levels, and refineries were operated at rates which could not be sustained regularly.

United States fields still are producing at higher rate than would be resorted to normally, for under usual conditions, reserves would have been kept better abreast of demand for crude. However, the situation on producing ability in relation to demand now appears better, not only because of the relief afforded by foreign supplies but also by the present intensified drilling in the United States, which holds promise of fair results henceforth in finding new fields and further developing existing fields.

Similarly, there has been some easing of the strain on domestic refineries, not only by increased availability of foreign refined products but also by the placing into operation of some additional refining capacity in the United States, in the concluding phase of the refinery expansion program.

Highest production of crude oil in the United States so far recorded or in prospect occurred during September, when the average was 4,756,000 barrels daily. In October, output was slightly lower, under reduced federal and state government quotas and allowables, and production is due to be under the September peak also in November. In the first 9 months of this year, United States crude output was 13 percent greater than in the corresponding months last year and 21 percent above the like period of 1941, last prewar year for the country. Of the increase in production this year over last year, Texas has furnished 92 percent, and of the increase for 1944 over 1941, Texas has supplied 84 percent. In making possible the sharp expansion of the supply of crude available to the nation, Texas producers turned out at their wells in the first 9 months of this year 32 percent more crude than in the like months of 1943 and approximately 50 percent more than in January-September, 1941. Some other states also have steadily expanded production, although less spectacularly than Texas. These include California, up 9 percent over last year and 35 percent over 1941; Louisiana, up 6 percent over last year and 15 percent over 1941; and sustained increases in Arkansas, Colorado, Kentucky, and Montana. New Mexico also has gone into new high ground, although production in 1943 was less than in 1941. Seven states increased in 1943 over 1941 but have not sustained last year's rate in 1944; they include Kansas, Michigan, Mississippi, New York, Ohio, Oklahoma, Wyoming. Several states have the unfavorable records of having produced less in 1944 than in either 1943 or 1941, having steadily declined; they include

Stocks of Crude Petroleum in U. S. by Grades, on October 1, 1941-1944

(Based on Weekly Report of U. S. Bureau of Mines)

THOUSANDS OF BARRELS

Grade or Origin	STOCKS, OCTOBER 1			
	1941	1942	1943	1944
Pennsylvania Grade	3,880	3,193	2,618	2,357
Other Appalachian	1,443	1,401	1,510	1,518
Lima-Michigan	996	1,552	1,049	910
Illinois-Indiana	19,302	10,348	11,399	15,179
Arkansas	2,794	2,599	2,814	2,866
Kansas	7,900	6,854	8,262	8,522
Louisiana	12,402	13,299	13,488	12,709
Northern	4,159	4,624	4,452	3,192
Gulf Coast	8,243	8,675	9,036	9,517
Mississippi	1,912	1,423	1,185	1,064
New Mexico	7,053	5,874	8,140	6,655
Oklahoma	53,712	43,861	35,208	30,699
Texas	81,788	101,430	102,759	108,371
East Texas	20,024	24,628	22,870	20,299
West Texas	17,152	24,295	23,267	31,446
Gulf Coast	24,510	28,290	31,198	29,450
Other Texas	20,102	24,217	25,424	27,176
Panhandle	.....	4,567	6,271	6,216
North	.....	7,036	5,805	6,238
South	.....	4,874	4,914	6,254
Other	.....	7,740	8,434	8,468
Rocky Mountain	15,646	14,822	12,760	7,458
California	34,870	34,772	32,814	22,167
Foreign	2,663	210	542	1,915
Total gasoline bearing in United States	246,361	241,638	234,548	222,390
Heavy in California	10,314	10,212	8,792	6,661
Total U. S.	256,675	251,850	243,340	229,051

U. S. Crude Runs to Stills and Percent of Refinery Capacity Used, by Districts, September and First 9 Months

Runs from Bureau of Mines, except September, 1944, from American Petroleum Institute; Capacities from American Petroleum Institute

THOUSANDS OF BARRELS

REFINING DISTRICT	CRUDE RUNS IN SEPTEMBER							REFINING CAPACITY AND USE, SEPTEMBER						TOTAL AMOUNT CRUDE RUN TO STILLS, FIRST 9 MONTHS			
	Total Amount Run				Daily Average Run			Daily Capacity			Percent Capacity Used						
	Sept., 1941	Sept., 1943	Sept., 1944	% Dif. '43-'44	Sept., 1941	Sept., 1943	Sept., 1944	Sept., 1941	Sept., 1943	Sept., 1944	Sept., 1941	Sept., 1943	Sept., 1944	9 Months 1941	9 Months 1943	9 Months 1944	% Dif. '43-'44
East Coast, Texas Inland, Texas Gulf, La. Gulf, Ark., and La. Inland	62,803	63,383	73,722	+16.3	2,093	2,113	2,457	2,284	2,444	2,518	91.6	86.5	97.6	533,341	488,651	640,126	+30.9
Appalachian	4,650	4,702	4,810	+ 2.3	155	157	160	166	177	177	93.4	88.7	90.4	39,865	41,850	42,182	+ .8
Indiana, Illinois, Kentucky, etc	22,076	22,399	22,490	+ .4	736	746	750	752	824	824	97.9	90.5	91.0	184,621	196,638	207,485	+ 5.5
Oklahoma, Kansas, Missouri	11,116	10,300	11,240	+ 9.1	371	343	375	413	416	418	89.8	82.5	89.7	94,311	92,728	98,534	+ 6.3
Rocky Mountain	3,273	3,380	3,617	+ 7.0	109	113	121	136	147	154	80.1	76.9	78.6	25,152	25,888	30,331	+17.2
California	17,563	21,924	23,169	+ 5.7	585	731	772	787	817	817	74.3	89.5	94.5	158,606	196,418	216,731	+10.3
Total United States	121,481	126,088	139,048	+10.3	4,049	4,203	4,635	4,538	4,825	4,908	89.2	87.1	94.4	1,035,896	1,042,173	1,235,389	+18.5

Illinois, Indiana, Nebraska, Pennsylvania, West Virginia.

In spite of record-breaking United States crude production, the heavy requirements have necessitated drawing on stocks besides using current domestic supply and lately increased imports. The national inventory of crude remains close to the recently reached 23-year low, stocks of refinable crude having stood at 222,390,000 barrels at the end of September and being still around that same level. The crude stocks are about 24,000,000 barrels lower than at this time of 1941, one half of the national draft having occurred in California and the other half east of California. The latter reduction is the net result of a heavy decrease in stocks of Oklahoma grade and declines in Illinois-Indiana, Mississippi, Pennsylvania, and Rocky Mountain crudes, which have been only partly offset by increases in grades produced in Texas, Kansas, Louisiana, Arkansas.

Runs to Stills

Crude runs to stills were steadily increased in the earlier months of this year, in reflection of the completion of new refining facilities, until they reached an all-time peak of 4,665,000 barrels daily in June, and they have been maintained fairly close to that record level ever since. Runs to stills were slightly higher in 1943 than in 1941, although curves for the two years almost coincided; but the trend for this year has been sharply above the old curves. In the first 9 months of 1944, the amount of crude run to stills was 18.5 percent greater than that run in the like period of 1943 and 19.2 percent above 1941. In spite of changes in crude producing ability of the various states, there has been efficient mobilization of transportation facilities and lining up of crude supplies for individual plants, with the result that all major refining districts have processed more crude this year than ever before. In September, the amount of crude charged to stills represented 94.4 percent of the rated capacity of the nation's refineries, with plants in practically all refining districts operating around or above 90 percent of potential. As compared with the 94.4 percent rate for the nation in September of this year, capacity was utilized only to the extent of 87.1 percent in September, 1943, and 89.2 percent in September, 1941. The present high rate reflects the extreme and successful efforts to minimize shutdown time.

Demand Higest on Record

The gains of 13 and 18 percent in crude production and crude runs to stills this year reflect a comparable increase in demand for all oils, which is breaking all previous records. Based on domestic production of crude and natural gasoline and net change in stocks of crude, natural gasoline, and products, total demand for all oils was over 11 percent greater for the first 9 months of this year than in the like period last year, and the corresponding increase for September was nearly 6 percent. These figures do not take into consideration imports, because of censorship, but it is generally known that imports are running substantially higher this year than last year, involving primarily crude and heavy fuel oil. Therefore, this year's increase in total

Stocks of Major Petroleum Products Held by Refining Companies in U. S. at End of September, Compared with Year Ago, and 3 Years Ago

Stocks at refineries, at bulk terminals, in transit, and in pipe lines. Data for 1941 and 1943 from Bureau of Mines monthly reports; for 1944 from weekly reports of American Petroleum Institute.

THOUSANDS OF BARRELS

DISTRICT	FINISHED AND UNFINISHED GASOLINE Stocks End of September			KEROSINE Stocks End of September			GASOIL AND DISTILLATE FUEL Stocks End of September			RESIDUAL FUEL OIL Stocks End of September		
	1941	1943	1944	1941	1943	1944	1941	1943	1944	1941	1943	1944
East Coast, Texas Gulf, La. Gulf, N. La., Ark., and Inland Texas	37,687	29,773	35,835	7,798	6,820	10,143	29,219	18,176	24,658	22,514	18,153	22,292
Appalachian	3,477	2,353	3,559	302	336	415	801	895	668	639	422	439
Indiana, Illinois, Kentucky	15,430	14,089	16,334	1,757	2,240	2,621	6,058	6,101	6,327	4,468	3,409	4,055
Oklahoma, Kansas, Missouri	6,993	5,910	6,814	690	821	833	2,150	2,024	2,037	2,067	1,561	1,574
Rocky Mountains	1,373	1,125	1,580	109	71	114	332	410	416	538	701	698
California	15,003	15,969	13,906	1,006	622	457	12,852	12,075	11,223	53,526	33,731	26,507
Total United States	79,963	69,219	78,028	11,662	10,910	14,583	51,412	39,681	45,329	83,752	57,977	57,565

Refinery Production of Major Products and Percent Yield from Crude Run, by Districts

Results in September and first 9 months, 1944, compared with those in like periods last year and in 1941, last pre-war year for U.S. Table based on Bureau of Mines statistics, except data for September, 1944, estimated with aid of A.P.I. weekly bulletins.

THOUSANDS OF BARRELS

DISTRICT	*Gasoline			Kerosine			Distillate Fuel Oil			Residual Fuel Oil			Lubricants		
	1941	1943	1944	1941	1943	1944	1941	1943	1944	1941	1943	1944	1941	1943	1944
East Coast, Texas Gulf, La. Gulf, North La., Ark., and Inland Texas															
Production, September	28,604	25,443	30,293	3,877	3,460	3,941	9,934	11,640	12,149	14,124	17,127	18,554	1,884	1,655	1,643
(Daily Average)	953.5	848.1	1,009.8	129.2	115.3	131.4	331.1	388.0	405.0	470.8	570.9	618.5	62.8	55.2	61.4
Percent Yield from Crude	42.0	35.3	36.5	6.2	5.5	5.3	15.8	18.4	16.5	22.5	27.0	25.2	3.0	2.6	2.3
Production, Jan.-Sept.	240,171	195,918	262,130	34,085	30,375	36,830	82,159	82,324	109,312	125,280	133,391	166,546	15,538	14,620	16,516
(Daily Average)	879.8	717.6	956.7	124.8	111.3	134.4	300.9	301.6	398.9	458.9	488.6	607.8	56.9	53.6	60.2
Appalachian															
Production, September	2,240	1,980	2,018	269	301	324	398	575	478	676	787	698	544	498	432
(Daily Average)	74.7	66.0	67.3	9.0	10.0	10.8	13.3	19.2	15.9	22.5	26.2	23.3	18.1	16.6	14.1
Percent Yield from Crude	47.2	41.3	41.3	5.8	6.4	6.7	8.6	12.2	9.9	14.5	16.7	14.5	11.7	10.6	8.8
Production, Jan.-Sept.	18,999	16,533	17,962	2,389	2,876	2,969	3,628	4,972	4,659	5,821	8,243	6,887	4,755	4,257	3,915
(Daily Average)	69.6	60.6	65.6	8.8	10.5	10.8	13.3	18.2	17.0	21.3	30.2	25.1	17.4	15.6	14.3
Indiana, Illinois, Kentucky															
Production, September	12,568	11,124	11,789	1,056	1,095	1,132	2,235	2,859	2,308	3,872	4,755	4,748	376	370	315
(Daily Average)	418.9	370.8	393.0	35.2	36.5	37.7	74.5	95.2	76.9	129.1	158.5	158.3	12.5	12.3	10.5
Percent Yield from Crude	53.9	46.4	49.3	4.8	4.9	5.0	10.1	12.8	10.3	17.5	21.2	21.1	1.7	1.7	1.4
Production, Jan.-Sept.	100,996	92,058	105,031	8,704	10,755	10,357	19,456	25,912	25,425	34,613	45,470	42,736	3,097	3,390	3,267
(Daily Average)	369.9	337.2	383.3	31.9	39.4	37.7	71.3	94.9	92.7	126.8	166.5	156.0	11.3	12.4	12.0
Oklahoma, Kansas, Missouri															
Production, September	6,361	5,436	6,177	553	608	554	1,191	1,279	1,664	1,941	1,800	2,035	348	401	360
(Daily Average)	212.0	181.2	205.9	18.4	20.3	18.4	39.7	42.6	55.4	64.7	60.0	67.8	11.6	13.4	12.0
Percent Yield from Crude	52.9	48.6	50.9	5.0	5.9	4.9	10.7	12.4	14.8	17.5	17.5	18.1	3.1	3.9	3.2
Production, Jan.-Sept.	52,226	43,980	50,372	5,646	6,398	5,916	9,940	13,196	14,162	16,488	19,146	17,665	2,885	3,237	3,297
(Daily Average)	191.3	161.1	183.8	20.7	23.4	21.6	36.4	48.3	51.7	60.4	70.1	64.5	10.6	11.8	12.0
Rocky Mountain															
Production, September	1,601	1,525	1,678	81	54	68	265	338	399	645	819	936	8	24	25
(Daily Average)	53.4	50.8	55.9	2.7	1.8	2.3	8.8	11.3	13.3	21.5	27.3	31.2	.3	.8	.8
Percent Yield from Crude	45.0	43.5	43.2	2.5	1.6	1.9	8.1	10.0	11.0	19.7	24.2	25.8	.2	.7	.7
Production, Jan.-Sept.	13,242	11,987	14,529	663	595	634	2,092	2,751	3,322	5,421	7,419	8,139	122	179	190
(Daily Average)	48.5	43.9	53.0	2.4	2.2	2.3	7.7	10.1	12.1	19.9	27.2	29.7	.5	.6	.7
California															
Production, September	7,614	8,139	8,747	113	299	197	2,001	1,832	2,583	6,680	11,322	11,082	267	288	324
(Daily Average)	253.8	271.3	291.6	3.8	10.0	6.6	66.7	61.1	86.1	228.7	377.4	369.4	8.9	9.6	10.8
Percent Yield from Crude	35.9	31.0	32.1	0.6	1.4	0.8	11.4	8.4	11.1	39.1	51.6	47.8	1.5	1.3	1.4
Production, Jan.-Sept.	63,319	66,794	80,564	1,619	2,631	2,034	21,915	22,511	23,118	64,708	94,363	99,662	2,487	2,555	2,985
(Daily Average)	231.9	244.7	294.0	5.9	9.6	7.4	80.3	82.5	84.4	237.0	345.9	363.7	9.1	9.4	10.6
Total United States															
Production, September	58,988	53,647	60,702	5,949	5,817	6,216	16,024	18,523	19,581	28,118	36,610	35,053	3,427	3,236	3,396
(Daily Average)	1,966.3	1,788.2	2,023.4	198.3	193.9	207.2	534.1	617.4	652.7	937.3	1,220.3	1,168.4	114.2	107.9	109.7
Percent Yield from Crude	44.6	38.1	39.4	4.9	4.6	4.5	13.2	14.7	15.8	23.1	29.0	25.2	2.8	2.6	2.4
Production, Jan.-Sept.	488,953	427,270	530,588	53,106	53,630	58,740	139,190	151,666	179,998	252,331	308,032	338,635	28,884	28,238	30,099
(Daily Average)	1,791.0	1,623.1	1,936.4	194.5	196.4	214.4	509.9	555.6	656.9	924.3	1,128.3	1,235.9	105.8	103.4	109.5

* Production includes straight run, cracked, and natural blended at refineries. Yield indicates percent of crude runs made into straight run and cracked gasoline.

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demand is higher than the mentioned 11 percnet when imports are considered.

Attesting the improvement this year in balancing supply with demand, stocks of all oils on September 30 were approximately the same as at the beginning of the year, whereas the first 9 months of the several preceding years required moderate to heavy withdrawals from storage—16 millions of barrels in 1943, 43 millions in 1942, 18 millions in 1941. In September of this year there was a 5,558,000-barrel accumulation in stocks of all oils, compared with virtually no September changes in 1943 and 1941 and a 1,591,000-barrel withdrawal in 1942. The maintenance of stocks this year has been characterized, however, by concurrent reduction of crude stocks in building up stocks of refined products, with runs to stills running exceptionally high in relation to crude production. In spite of the stabilizing of stocks, inventories are abnormally light in relation to the prevailing unprecedented demand, and the stocks of all oils on September 30 represented only 101 days' supply, on the basis of daily average demand in the first 9 months of this year. Stocks at the end of September in earlier years represented 111 days' supply in 1943, 123 days' in 1942, and 135 days' supply in 1941.

Refined Products

Unprecedented demand for all oils in the aggregate this year reflects record-breaking requirements of all of the major refined products, including gasoline, residual fuel oil, distillate fuel oil, and kerosine. In response to the high demand, production of these products has broken all previous records, and following earlier difficulties in meeting supply, there has been this year a restoration of relatively favorable inventory positions for the various products.

Noteworthy among trends for individual products are those involving motor fuel and residual fuel oil. In response to the highest trend of motor fuel production this year ever recorded, with output well above 2,000,000 barrels daily since last spring, the stocks of motor fuel were pushed above the 1943 curve at the beginning of summer and they subsequently have been maintained steadily several millions of barrels above the 1943 trend. Although they have remained about 10 millions of barrels under the 1941 trend, the motor fuel stocks have been comfortably adequate, with civilian supplies rationed. However, stocks are only about 9 percent above a year ago, whereas demand was nearly 21 percent greater in the first 9 months of this year than in the like period last year, and inventories now represent only 35 days' supply, against 39 days' supply held a year ago.

Data on residual fuel oil reflects especially the influence of the Caribbean area in taking over a large part of the burden of supplying requirements. Domestic production of residual fuel has been gradually lowered since the early part of this year, yet stocks have been steadily increased in an aggregate amount of over 10 millions of barrels from the war time low of last spring. In this upturn, the curve for 1944 recently reached and crossed above that for 1943. The gradual cut-back in production of residual fuel oil has permitted a steady cutting down of the yield of this lower-grade although highly important product at refineries, from 29 percent in January to 26 percent in August. Conversely, the

Production, Changes in Stocks, and Demand for Crude and Products

Bureau of Mines figures except September, 1944, estimated with aid of A.P.I. Bulletins. (Thousands of Barrels)

ITEM	SEPTEMBER				% Dif. '43-'44	FIRST 9 MONTHS				% Dif. '43-'44
	1941	1942	1943	1944		1941	1942	1943	1944	
ALL OILS										
Domestic Production, Total	126,641	123,100	138,109	151,228	+ 9.5	1,085,154	1,092,559	1,164,535	1,317,855	+ 13.2
(Daily Average)	4,221	4,103	4,604	5,041	+ 9.5	3,975	4,002	4,266	4,810	+ 12.8
Crude Oil	119,320	115,933	130,407	142,678	+ 9.4	1,024,420	1,029,258	1,097,875	1,242,818	+ 13.2
Natural Gasoline	7,057	6,967	7,702	8,550	+ 11.0	58,198	61,504	66,660	75,037	+ 12.6
Benzol	264	200				2,536	1,797			
Imports, Total	10,093					68,664				
Crude	4,662					36,334				
Refined	5,431					32,330				
Change in Stocks	+197	—1,591	+324	+5,558		—18,441	—43,830	—16,571	+1,297	
Stocks Beginning of Period	544,639	514,186	481,045	479,793	— 0.3	563,277	556,425	497,940	484,054	— 2.9
Stocks End of Period	544,836	512,595	481,369	485,351	+ 0.8	544,836	512,595	481,369	485,351	+ 0.8
(Days' Supply)	129	123	105	100	— 4.8	135	123	111	101	— 9.0
Refinable Crude	246,731	240,588	236,287	222,390	— 5.9	246,731	240,588	236,287	222,390	— 5.9
Heavy Crude in Calif.	10,321	10,167	8,905	6,661	— 25.2	10,321	10,167	8,905	6,661	— 25.2
Natural Gasoline	5,373	6,056	4,723	4,100	— 13.2	5,373	6,056	4,723	4,100	— 13.2
Refined Products	282,411	255,784	231,454	252,200	+ 9.0	282,411	255,784	231,454	252,200	+ 9.0
Demand, excl. of imports	126,641	124,691	137,785	145,670	+ 5.7	1,103,595	1,136,389	1,181,106	1,316,558	+ 11.5
(Daily Average)	4,221	4,156	4,593	4,856	+ 5.7	4,042	4,163	4,326	4,805	+ 11.1
Demand, incl. of imports	136,537					1,172,259				
CRUDE OIL—										
Demand by Source—										
Domestic Production	119,320	115,933	130,407	142,678	+ 9.4	1,024,420	1,029,258	1,097,875	1,242,818	+ 13.2
(Daily Average)	3,977	3,864	4,347	4,756	+ 9.4	3,752	3,770	4,022	4,536	+ 12.8
Imports	4,662					36,334				
Change in Stocks, Refinable	—3,519	—4,082	—798	—1,511		—17,978	—6,911	+1,398	—19,372	
Stocks, Beginning of Period	250,240	244,670	237,085	223,901	— 5.6	264,709	247,499	234,889	241,762	+ 2.9
Stocks, End of Period	246,731	240,588	236,287	222,390	— 5.9	246,731	240,588	236,287	222,390	— 5.9
(Days' Supply)	60	60	54	46	— 14.8	65	63	59	48	— 18.6
Demand, excl. of imports	122,839	120,015	131,205	144,189	+ 9.9	1,042,398	1,036,169	1,096,476	1,262,190	+ 15.1
(Daily Average)	4,095	4,000	4,373	4,806	+ 9.9	3,818	3,795	4,016	4,607	+ 14.7
Demand, incl. of imports	127,501					1,078,732				
Demand by Use—										
Run to Stills, Total	121,481	113,474	126,088	139,048	+ 10.3	1,035,896	992,012	1,042,173	1,235,389	+ 18.5
(Daily Average)	4,049	3,782	4,203	4,635	+ 10.3	3,794	3,634	3,817	4,509	+ 18.1
Domestic	116,994	113,228	123,872	134,548	+ 8.6	999,291	977,841	1,037,762	1,203,932	+ 16.0
Foreign	4,487	246	2,216	4,500	+ 103.1	36,605	14,171	4,411	31,457	+ 613.1
Exports	2,900					25,722				
Transfers to fuel oil stocks, used as fuel, losses	3,731	7,316	7,965	6,800	— 14.6	18,699	56,033	60,647	57,000	— 6.0
Demand, excl of exports	125,212					1,054,595				
Demand, incl. of exports	128,112	120,790	134,053	145,848	+ 8.8	1,080,317	1,048,045	1,102,820	1,292,389	+ 17.2
(Daily Average)	4,270	4,026	4,468	4,862	+ 8.8	3,957	3,839	4,040	4,717	+ 16.8
MOTOR FUEL										
Production, Total	61,067	49,558	54,847	62,183	+ 13.4	511,253	458,097	440,828	545,837	+ 23.8
(Daily Average)	2,036	1,652	1,828	2,073	+ 13.4	1,873	1,678	1,615	1,992	+ 23.4
Imports	105					261				
Change in Stocks	—1,071	—2,459	—1,648	—1,359		—5,513	—15,247	—11,495	—111	
Stocks, beginning of period	79,205	77,808	65,557	70,753	+ 7.9	83,647	90,596	75,404	69,505	— 7.8
Finished Gasoline	73,094	71,403	60,664	66,542	+ 9.7	77,943	86,159	70,772	64,964	— 8.2
Natural Gasoline	6,111	6,405	4,893	4,211	— 13.9	5,704	4,437	4,632	4,541	— 2.0
Stocks, End of period	78,134	75,349	63,909	69,394	+ 8.6	78,134	75,349	63,909	69,394	+ 8.6
(Days' Supply)	38	43	34	33	— 2.9	41	43	39	35	— 10.3
Finished Gasoline	72,761	69,293	59,186	65,294	+ 10.3	72,761	69,293	59,186	65,294	+ 10.3
Natural Gasoline	5,373	6,056	4,723	4,100	— 13.1	5,373	6,056	4,723	4,100	— 13.1
Demand, excl. small imports	62,138	52,017	56,495	63,542	+ 12.5	516,766	473,344	45,323	545,948	+ 20.7
(Daily Average)	2,071	1,734	1,883	2,118	+ 12.5	1,893	1,734	1,657	1,992	+ 20.3
GASOLINE—Finished										
Production (Straight run, cracked, natural blended)	58,988	48,078	53,647	60,792	+ 13.1	488,963	441,031	427,270	530,588	+ 24.2
(Daily Average)	1,966	1,602	1,788	2,023	+ 13.1	1,791	1,615	1,561	1,936	+ 24.0
Pct. yield, str. run, cracked	44.6	37.9	38.1	39.4		43.9	40.3	36.7	39.0	
Imports						261				
Change in Stocks, Finished	—333	—2,110	—1,478	—248		—5,182	—16,866	—11,586	+330	
Stocks, beginning of period	73,094	71,403	60,664	65,542	+ 9.7	77,943	86,159	70,772	64,964	— 8.2
Stocks, end of period	72,761	69,293	59,186	65,294	+ 10.3	72,761	69,293	59,186	65,294	+ 10.3
(Days' Supply)	36	41	32	32		40	41	37	34	— 8.1
Demand, excl. small imports	59,321	50,188	55,125	60,950	+ 10.6	494,135	457,897	438,856	530,258	+ 20.8
(Daily Average)	1,977	1,673	1,837	2,032	+ 10.6	1,810	1,677	1,608	1,935	+ 20.3
KEROSINE										
Production	5,949	5,421	5,817	6,216	+ 6.8	53,106	50,457	53,630	58,740	+ 9.5
(Daily Average)	198	181	194	207	+ 6.8	194	185	196	214	+ 9.5
Percent yield from crude	4.9	4.8	4.6	4.5		5.1	5.1	5.1	4.8	
Imports						124				
Change in Stocks	+26	+187	+624	+1,244		+2,150	—2,152	+846	+5,224	
Stocks, beginning of period	11,636	12,176	10,286	13,339	+ 29.7	9,512	14,515	10,064	9,359	— 7.0
Stocks, end of period	11,662	12,363	10,910	14,583	+ 33.7	11,662	12,363	10,910	14,583	+ 33.7
(Days' Supply)	59	71	63	88	+ 39.7	51	64	57	75	+ 31.6
Demand, excl. small imports	5,923	5,234	5,193	4,972	— 4.2	50,956	52,609	52,784	53,516	+ 1.4
(Daily Average)	197	174	173	166	— 4.2	187	193	193	195	+ 1.0
DISTILLATE FUEL OIL										
Production	16,024	18,062	18,523	19,581	+ 5.7	139,190	142,221	151,666	179,998	+ 18.7
(Daily Average)	534	602	617	653	+ 5.7	510	521	556	657	+ 18.2
Percent yield from crude	13.2	15.9	14.7	15.8		13.4	14.3	14.6	14.6	
Transfers from Crude	210	217	261	255	— 2.3	1,856	1,810	2,227	2,395	+ 7.5
Imports	814					3,790				
Change in Stocks	+4,249	+2,899	+2,750	+4,617		+8,501	—3,513	—5,259	+3,611	
Stocks, beginning of period	47,163	42,918	36,931	40,712	+ 10.2	42,911	49,330	44,940	41,718	— 7.2
Stocks, end of period	51,412	45,817	39,681	45,329	+ 14.2	51,412	45,817	39,681	45,329	+ 14.3
(Days' Supply)	129	89	74	89	+ 20.3	106	85	68	70	+ 2.9
Demand, excl. of imports	11,985	15,380	16,034	15,219	— 5.1	132,545	147,544	159,152	178,782	+ 12.3
(Daily Average)	399	513	534	507	— 5.1	486	540	583	652	+ 11.8
Demand, incl. of imports	12,799					136,335				
RESIDUAL FUEL OIL										
Production	28,118	30,402	36,610	35,053	— 4.2	252,331	264,461	308,032	338,635	+ 9.9
(Daily Average)	937	1,013	1,220	1,168	— 4.2	924	969	1,128	1,236	+ 9.6
Percent yield from crude	23.1	26.8	29.0	25.2		24.4	26.7	29.6	27.5	
Transfers from crude	2,152	1,971	2,253	2,200	— 2.3	8,728	14,967	16,976	21,007	+ 23.7
Imports	4,327					25,400				
Change in Stocks	+1,484	+1,651	+1,120	+4,059		—4,274	—13,695	—3,806	+9,081	
Stocks, beginning of period	82,268	67,613	56,857	53,506	— 5.9	88,026	82,959	61,783	48,484	— 21.5
Stocks, end of period	83,752	69,264	57,977	57,565	— 0.7	83,752	69,264	57,977	57,565	— 0.7
(Days' Supply)	94	72	49	52	+ 6.1	89	68	51	45	— 11.8
Demand, excl. of imports	26,634	28,751	35,490	33,194	— 6.5	256,605	278,156	311,838	350,561	+ 12.4
(Daily Average)	888	958	1,183	1,106	— 6.5	940	1,019	1,142	1,279	+ 12.0
Demand, incl. of imports	30,961					282,005				

THE SCHLUMBERGER FLEET OF STREAMLINE FIELD SERVICE UNITS REFLECTS A DECADE OF PROGRESS AND ACCEPTANCE OF SCHLUMBERGER SERVICES

Louisiana — 1933
De Vilbiss No. 2

THIS IS THE 10th ANNIVERSARY OF SCHLUMBERGER WELL SURVEYING CORP.

lower production and refinery yield of residual fuel have released more crude for conversion into gasoline, the industry's No. 1 product, quantitatively and qualitatively. In August, the yield of gasoline from crude run at United States refineries was 39.4 percent, slightly above yields around or below 39 percent in earlier months of the year. Under the war time heavy need for residual fuel and the rationing of gasoline, the yield of gasoline was reduced from over 45 percent in November and December, 1941, to a low of 35.3 percent in April, 1943, and from that low it gradually was increased back up to the 39 percent or better of this year.

Kerosine Production Higher

Distillate fuel oil production has been consistently higher this year than ever before, in response to the highest demand on record, and the seasonal trends of stocks have been close to average for recent years. Inventories have been and continue around 5 millions of barrels lower than in 1941 but several millions of barrels higher than in 1943. The increase of stocks over last year has been about in line with the increase in prevailing demand, and on the basis of days' supply, inventories are about the same as a year ago. Yields of distillate fuel at refineries have continued comparatively large, that is, around 14.5 to 15 percent.

Demand for kerosine has shown practically no change during the past 3 years, having been a little higher than in 1941. But production has been nearly 10 percent higher this year than last year, and stocks have been increased, being now about 3,500,000 barrels higher than a year ago.

Illinois Water Flooding Described in Pamphlet

Water-flooding operations in southeastern Illinois fields are reviewed by the Bureau of Mines in Report of Investigations 3778, copies of which are available for free distribution from the Washington office.

Many of the shallow fields of the area appear to be well-suited to this method of secondary recovery, the report stated, and if projects now under way are successful it will become the fourth state to use this method, already established in Pennsylvania, Oklahoma and Kansas.

Interest in the possibilities of this method of secondary recovery was increased in the Illinois fields as the result of chance flooding of oil sands through leaky well casings or other accidental means resulted in "phenomenal increases in the rate of oil production in southeastern fields," the bureau said.

When the survey was made, as of July 1, 1944, some 15 experimental projects were in operation and others were contemplated.

Due to their shallow depth, fields producing from the Upper Casey sand in Clark County and those producing from the Robinson sand in Crawford County are attracting particular attention in Illinois, although other controlled projects are being conducted in deeper-seated formations. Among these latter operations is one in the McClosky limestone in the Clay City field at an average depth of 3000 feet, one of the few projects in which a limestone reservoir is being flooded to increase output.

U. S. Crude Oil Production, by States and Districts, September and First 9 Months

From U. S. Bureau of Mines, except September, 1944, estimated from A.P.I. weekly reports, and breakdowns of Texas by districts based on A.P.I. and Texas Railroad Commission reports.

THOUSANDS OF BARRELS

State or District	MONTH TOTAL, SEPTEMBER 1941	1943	1944	Percent Change '43-'44	DAILY AVERAGE IN SEPTEMBER 1941	1943	1944	FIRST 9 MONTHS OF YEAR 1941	1943	1944	Percent Change '43-'44
Alabama			9				.3			25	
Arkansas	2,226	2,285	2,423	+ 6.4	74.2	76.2	80.8	19,641	20,339	22,026	+ 8.3
California	19,403	23,424	26,467	+13.0	646.8	780.8	882.2	170,969	211,470	230,553	+ 9.0
San Joaquin Val.	8,022	11,105	12,397	+11.6	267.4	370.2	413.2	69,517	98,991	107,767	+ 8.9
Coastal District	2,731	3,333	4,380	+31.4	91.0	111.1	146.0	23,654	29,716	36,766	+23.8
L. A. Basin	8,650	8,986	9,690	+ 7.8	288.4	299.5	323.0	77,798	82,763	86,020	+ 3.9
Colorado	183	200	260	+30.0	6.1	6.7	8.7	1,308	1,699	2,132	+25.5
Florida			1							11	
Illinois	12,692	6,592	6,294	— 4.5	423.1	219.7	209.8	96,586	61,958	58,303	— 5.9
Indiana	532	434	406	— 6.5	17.7	14.5	13.5	5,033	4,028	3,805	— 5.5
Kansas	7,393	8,475	8,305	— 2.0	246.4	282.5	276.8	60,049	81,053	74,460	— 8.1
Kentucky	391	740	855	+15.5	13.0	24.7	28.5	3,615	5,676	6,756	+19.0
Louisiana	9,595	10,470	10,845	+ 3.6	319.8	349.0	361.5	84,529	91,467	96,851	+ 5.9
North Louisiana	1,996	2,157	2,192	+ 1.6	66.5	71.9	73.1	18,979	20,944	18,356	—12.4
South Louisiana	7,599	8,313	8,653	+ 4.9	253.3	277.1	288.4	65,550	70,523	78,495	+ 1.1
Michigan	1,545	1,729	1,485	—14.1	51.5	57.6	49.5	11,050	15,798	13,972	— 1.2
Mississippi	1,694	1,470	1,463	— .5	56.5	49.0	48.8	8,957	14,569	11,885	—18.4
Missouri	4	3	3		.1	.1	.1	35	27	27	
Montana	642	688	666	— 3.2	21.4	22.9	22.2	5,511	5,785	6,447	+11.4
Nebraska	166	49	27	—44.9	5.6	1.6	.9	1,161	531	313	— 4.1
New Mexico	3,285	3,341	3,186	— 4.6	109.5	111.4	106.2	29,064	28,158	30,000	+ 6.5
New York	445	423	413	— 2.4	14.8	14.1	13.8	3,838	3,845	3,588	— 6.7
Ohio	287	278	247	—11.2	9.6	9.3	8.2	2,456	2,493	2,232	—10.5
Oklahoma	13,102	10,022	10,292	+ 2.7	436.8	334.1	343.1	115,743	92,472	91,615	— .9
Pennsylvania	1,440	1,290	1,189	— 7.8	48.0	43.0	39.6	12,352	12,068	10,884	— 9.8
Tennessee	1	1	1		.0	.0	.0	9	9	9	
Texas*	41,616	55,314	64,587	+16.8	1,387.2	1,843.8	2,152.9	369,675	417,222	550,685	+32.0
East Texas Field	10,560	11,400	11,130	— 2.4	352.0	380.0	371.0	96,157	93,573	100,895	+ 7.8
Rest of E. Texas	2,550	3,924	4,490	+14.4	85.0	130.8	149.7	20,813	31,426	36,591	+16.4
North Texas	3,985	4,218	4,435	+ 5.1	132.8	140.6	147.8	35,913	37,046	39,931	+ 7.8
West Texas	7,986	9,998	15,083	+50.9	266.2	333.3	502.8	66,098	64,639	114,788	+77.6
Texas Panhandle	2,407	3,120	2,961	— 5.1	80.2	104.0	98.7	20,049	25,049	25,980	+ 3.7
Gulf C. Upper	8,451	14,541	16,275	+11.9	281.7	484.7	542.5	66,709	104,488	143,915	+37.7
Gulf C. Lower	3,648	5,079	7,264	+43.0	121.6	169.3	242.2	32,708	35,272	57,759	+63.8
Southwest Texas	2,203	2,247	2,368	+ 5.4	73.4	74.9	78.9	19,579	16,075	21,131	+31.5
S. Central Texas	604	570	580	+ 1.8	20.1	19.0	19.3	5,432	4,646	5,396	+16.1
Utah								3	4		
West Virginia	289	274	261	— 4.7	9.6	9.1	8.7	2,550	2,540	2,348	— 7.6
Wyoming	2,515	2,905	2,993	+ 3.0	83.8	96.8	99.8	22,255	24,664	23,891	— 3.1
Total U. S.	119,446	130,407	142,678	+ 9.4	3,981.5	4,346.9	4,755.9	1,026,389	1,097,875	1,242,818	+13.2

* Texas data by districts based on A.P.I., and so do not agree exactly with state total, which is on Bureau of Mines basis.

John W. de Groot is New President of Tuscarora

Tuscarora Oil Company Limited, a subsidiary of the Standard Oil Company of New Jersey, announces that John W. de Groot, vice president, has been appointed president to succeed John P. Fallon, retired.

de Groot, vice president and manager of Tuscarora since May, 1943, began his company service in 1919 with the general engineering department of Standard Oil Company (New Jersey) at Bayway, following service in World War I. Commencing in 1921 he served as chief engineer in the Bayonne refinery. In March, 1940, he was appointed assistant to the president of Tuscarora, and a short while later became vice president.

A. F. Aylsworth succeeds de Groot as vice president and will retain his former position as superintendent. Aylsworth, superintendent of Tuscarora since 1940, started with the company in Newfoundland in 1907. With the exception of service in World War I, he has been continuously engaged in pipe line activities, and was formerly head of the Inter-Refinery pipe line department at the company's New Jersey works.

☆

FRANK J. KUCKERT, Tulsa supervisor of stocks and materials for The Carter Oil Company, retired November 1. He joined the organization May 15, 1918, and served throughout in the Tulsa office.

Texas Company Promotions

J. H. Puls, formerly in charge of the civil, production and development engineering staff of The Texas Company for the Pacific Coast area, has been named superintendent of drilling and production, with headquarters in Los Angeles.

Puls succeeds W. H. Farrand, who has been transferred to San Francisco as director and vice president in charge of production for American Overseas Petroleum Company. W. A. Clark, formerly district engineer at Fellows, California, will succeed Puls, and Clark will be succeeded by T. W. Bell.

☆

A. B. C. DAGUE, 70, died in Tulsa October 27. A native of Pennsylvania, he was superintendent of operations for the Standard Oil Company at Chanute, Kansas, from 1903 to 1905, when he became affiliated with the Bonner Springs Oil Company. Later he joined T. B. Slick in the development of the Slick-Carson pool. Later he was connected with Gypsy Oil Company.

JAMES ARTHUR HULL, 74, organizer of J. A. Hull Company, pioneer mid-continent oil firm since acquired by Sinclair Prairie Oil Company, died at Tulsa November 4. Hull went to Tulsa in 1908 after engaging in the oil business in Ohio, Indiana, Illinois and Kansas. He was one of the origial directors of the Exchange Bank of Tulsa.

INTERESTING *Inside* FACTS

About This Business of Making Whipstocks

Fifteen years ago we perfected the original Kinzbach Whipstock to the extent of performing successful sidetracking jobs at great savings in time, trouble, and money to operators. It was the result of a sound idea to fill a real need, worked out from practical field experience, thorough research, and development.

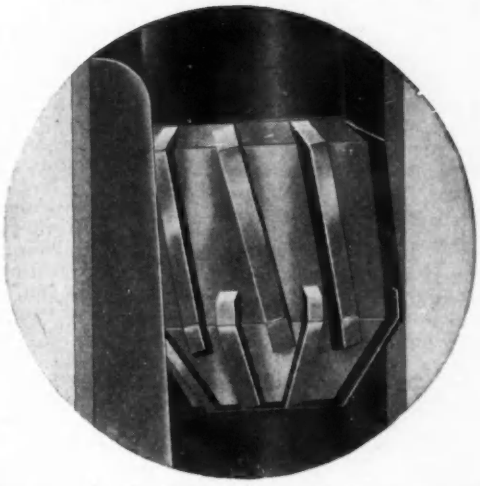
We have patented the valuable features of this whipstock, such as those illustrated below, and have consistently improved its design and construction through these fifteen years. The greatest advantage in the use of this type of equipment lies in the fact that the casing string is never parted. Consequently, there is no unsupported casing end above the whipstock, the lower nipple of which might be unscrewed or broken due to the friction and slap of the drill pipe, with the possibility of an expensive fishing job and loss of the window and all hole made below it. Casing strings are often sidetracked that are poorly cemented and, if completely severed, the lower section may either shift its position or settle lower in the hole, interfering with all operations from this point, or cause the bit to follow into the old hole alongside the casing. The segment of casing remaining, after milling a window with the tools illustrated, serves to support the whipstock and hold the casing above and below the window in alignment.

KINZBACH TOOL COMPANY, INC.

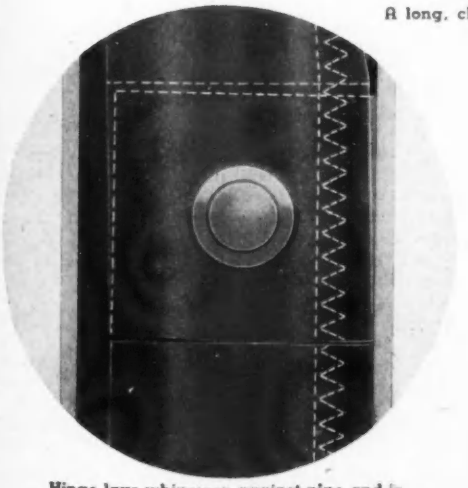
HOUSTON, TEXAS, U. S. A.

California: S. R. Bowen Company

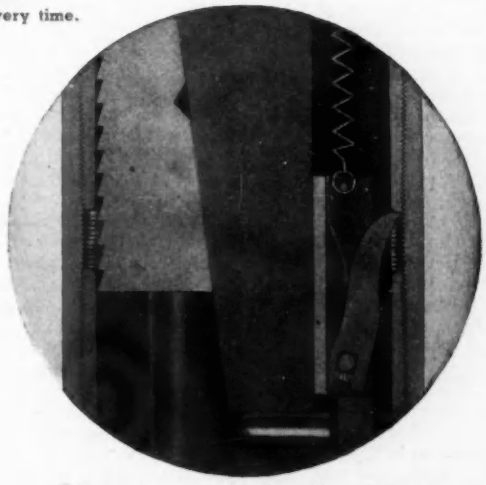
Export: 74 Trinity Place, New York City



A long, clean window every time.



Hinge lays whipstock against pipe and is tightly bolted.



Trigger assures setting for mill-out between couplings.

KINZBACH

Electrical Well Logging

By HUBERT GUYOD

Development Engineer,
Halliburton Oil Well
Cementing Company,
Duncan, Oklahoma

Determination of the fluid content of reservoirs from electric logs is usually considered to be difficult because it is based mainly on empirical methods. This article shows how better results can be obtained when the physical characteristics of the reservoirs or more fully taken into consideration

PART 13

Electrical Properties of Oil-Bearing Reservoirs

TWO years ago, when reviewing the progress in reservoir technology, Muskat[1] made the following statement:

"It was—around 1931 that the subject of oil reservoir technology—began to emerge from its infancy. At the beginning of the decade—reservoir technology was hardly more than an abstract phrase. No standardized techniques had been developed for the determination of either the characteristics of oil-bearing rocks or of the properties of oil reservoir fluids. The mechanics of oil production was still regarded as a simple application of hydraulic engineering—. The developments during the last decade have been so extensive and far-reaching that it is diffcult to understand the success that the industry enjoyed prior to this period. Is there a professional production engineer or petroleum geologist today who evaluates a saturated oil horizon solely on the basis of its porosity? Yet that was the common and generally accepted criterion for such evaluation ten years ago."

It is likely that ten years from now a similar remark can be made regarding the subject of electrical logging. In fact, the use of electric logs for the determination of the fluid content of permeable beds seems to be, at the present time, in the same state as reservoir technology was in 1931. Today, this determination is done mostly by inspection of the log and from experience accumulated in the area. Although important contributions toward a more efficient use of the electrical data have been made in the last years, the interpretation of electric logs is usually considered as being nothing else than a difficult art. It will be attempted here to show that a more scientific and successful method is frequently applicable to the solution of this problem.

The lengthy discussion offered in a previous article on the resistivity of water-bearing formations might be considered as being of only academic interest, since these formations are of little economic importance. This, however, is not true. Basically, oil and gas sands are water sands in which part of the conductive water has been replaced by a poor conductor, the oil or the gas. To understand fully the relation between the resistivity of a sand and the presence of petroleum, it is therefore necessary to have a good preliminary knowledge of the basic electrical characteristics of water-bearing formations. This has been very clearly pointed out by Archie[2], who wrote "A study of the resistivity of formations when all the pores are filled with water is of basic importance in the detection of oil or gas by the use of an electrical log. Unless this value is known, the added resistivity due to oil or gas in a formation cannot be determined."

Although little is known of the distribution of the gaseous phase in a gas sand, a series of measurements made by Wyckoff[3] on sands ranging from 20 percent to 43 percent in porosity shows that, as far as the resistivity is concerned, gas sands are probably quite similar to oil sands. It is felt, therefore, that the fundamental data which will be presented here for oil sands should apply to gas sands also, at least for saturations up to 75 percent.

Clean Oil Sands

The case of clean sands will be considered first. It will be assumed that the sand is not cemented, or only moderately cemented, that it does not contain silt or other small size particles (clay, bentonite, etc.) and that the pores are 100 percent filled with water and/or oil.

It is likely that in most oil sands all the solid materials constituting the reservoir are, under normal conditions, covered with a film of water. This water also completely fills the small crevices and pores. As a result, the oil is not in direct contact with the solid materials of the reservoir. The outermost layer of the fluids filling the pore space consists of a thin continuous film of water completely surrounding the oil pockets. If the oil saturation is large, the film of water is extremely thin and most of the oil pockets are interconnected by constricted oil channels. Under this condition a flow of oil is usually possible if proper pressure distribution exists or is created in the sand and in the bore hole. On the other hand, if the water saturation is large, all other factors remaining the same, most of the oil vesicles are entirely surrounded by water, and, in general, no appreciable oil production is possible although the amount of oil in the sand can be greater than the amount of water.

Several investigators, Archie[2], Wyckoff[3], Jakosky[4], Martin[5] and Leverett[6], have attempted to establish a relation between the oil or gas saturation of a sand and its resistivity. Although the nature of the reservoirs and that of the fluids used for these investigations were quite different, the results are surprisingly consistent. A few of these investigations were part of research projects not related to well logging. Others were made in a view to determine the potential productivity of sands from resistance measurements made in bore holes.

Part of these data are reproduced in Figure 13-1 which gives the experimental values of $\frac{\rho_o}{\rho_w}$ in terms of the oil or gas saturation fraction S. The symbol ρ_o denotes the true resistivity of the sand partly filled with oil or gas, the remaining pore space being filled with water of resistivity R_w. The symbol ρ_w designates the resistivity of the same sand filled entirely with this water. In other words the ratio $\frac{\rho_o}{\rho_w}$ measures the increase in resistivity of a water sand, when part of its water is replaced by oil or gas. The non-conductive fluid used by Wyckoff was carbon dioxide, and his experiments were made on four sands of porosity 19.65, 27.76, 35.4 and 42.96 percent, respectively. Jakosky's data were obtained with oil on a sandstone having a porosity of 23 percent. Martin's experiments refer to two sands of 45 and 20 percent porosity, the non-conductive liquid used being oil. Leverett's data are the average result obtained on four different sands, oil being the non-conductive fluid. The departure of Jakosky's results from those obtained by the other investigators might be due to the fact that direct current was used for the measurements. This may have introduced small errors due to polarization, notwithstanding the precautions taken.

During all these experiments the saturation process was obviously different from that which takes place in natural oil sands. It is not certain that the fluid distribution in these artificial oil sands is the same as in natural reservoirs. It is probable, however, that they are not too different for saturations less than approximately 80 percent. On the other hand, it is likely that larger divergences may occur for very high saturations. In practice, this is without great importance when only qualitative information is desired.

Resistivity Index

The average result of these investigations is represented by the curve of Figure 13-1. To determine easily the analytical relation existing between $\frac{\rho_o}{\rho_w}$ and the oil saturation, this curve has been replotted on log-log paper in terms of water saturation fraction W (Figure 13-2). The resulting graph is almost a straight line whose slope is 1.96, namely, very nearly 2. Therefore, its equation is approximately

$$\frac{\rho_o}{\rho_w} = W^{-2} \qquad (13\text{-}1)$$

As W equals 1 — S, equation (13-1) can be rewritten

$$\frac{\rho_o}{\rho_w} = (1 - S)^{-2} \qquad (13\text{-}2)$$

which is the equation of the curve of Figure (13-1). This relation can be expressed in the more convenient form

$$S = 1 - \left(\frac{\rho_o}{\rho_w}\right)^{-1/2} \qquad (13\text{-}3)$$

For the sake of simplicity, the ratio $\frac{\rho_o}{\rho_w}$ will be called "resistivity index" in the following discussion.

Equation (13-3) has been derived by

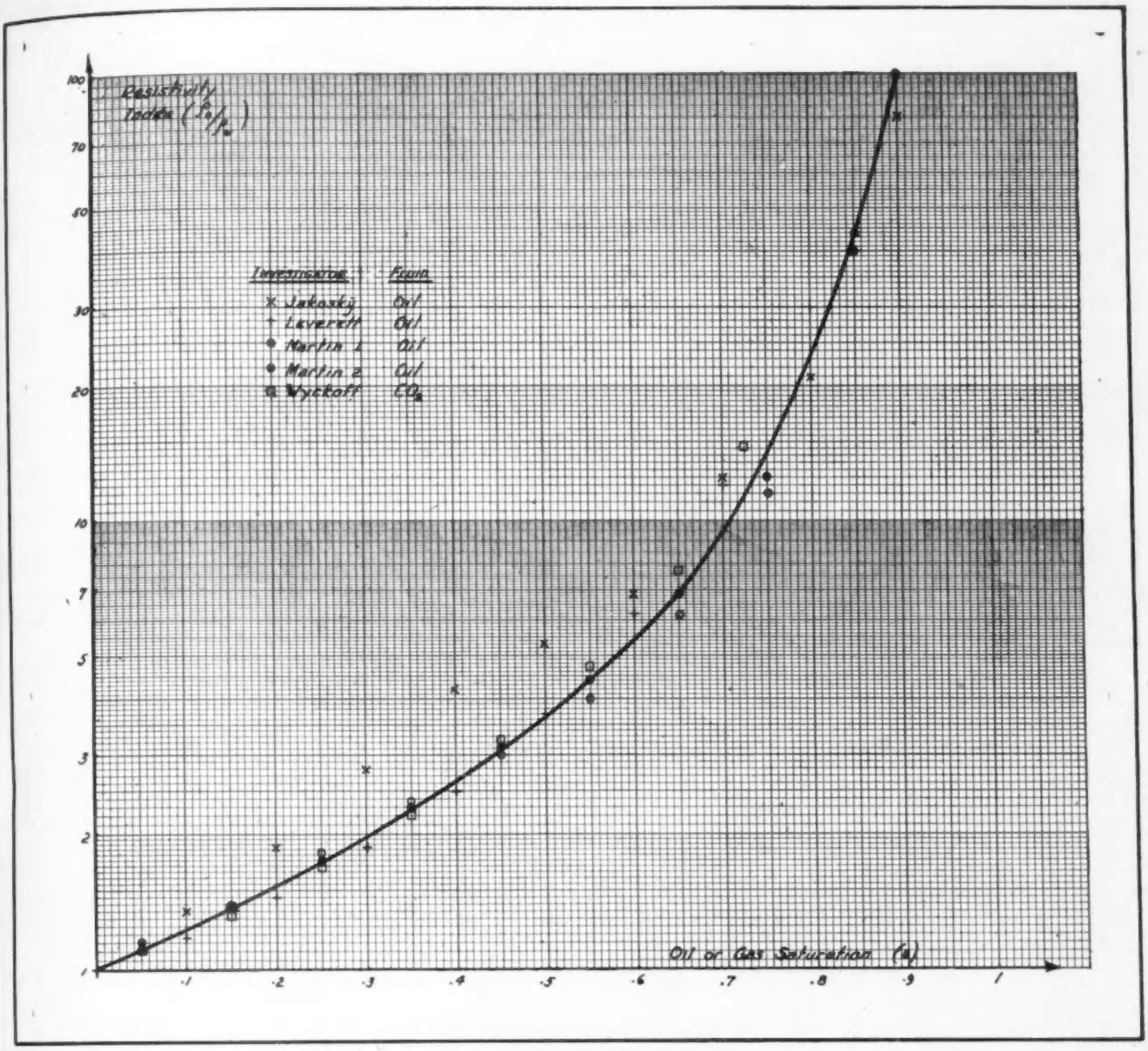


FIGURE 13-1
Relation between resistivity index and oil or gas saturation

using experimental data obtained on various kinds of reservoirs and fluids. Although the number of experiments made is relatively small, it seems that this equation can be used as a good approximation for the qualitative detection of oil or gas until more complete data is available. On the other hand, it would not be safe at present to use this equation for accurate quantitative determinations of oil saturation, especially for high values of resistivity index.

The following table gives the value of the resistivity index for a few particular values of saturation:

Oil or gas saturation...	.5	.6	.7	.8	.9
Resistivity index.....	3.6	5.6	10	21	80

An average sand will produce pipeline oil when the oil occupies more than 80 percent of the pore space. Referring to the table, it can be seen that this corresponds to a resistivity index of more than 20. It can therefore be said that, if the resistivity of a sand is more than 20 times the resistivity it has when it contains only water, then there is an excellent chance that the sand will produce oil. For certain sands, an even smaller saturation can give oil without water. In fact, many sands produce pipe line oil although their water saturation is 30 percent or more, i. e., when the resistivity index equals 10 or less. Theoretically, oil can be produced without water from sands containing a considerable proportion of water, provided the reservoir has adequate characteristics. The reason for this is explained in the following quotation from Graton and Fraser[7]: "Those special and powerful manifestations of surface energy which cause a liquid to wet and adhere to the surface of a solid take on accelerating importance as the distance between two solid surfaces decreases. The actual percentage of the total void volume effectively influenced by these special forces varies in some inverse relation to the grain size." It thus becomes merely a question of reducing the size of the grains until the adhesionary influence of the sand or water attains such a high value that water cannot be produced, however large its concentration is. This will be more specifically explained below.

Critical Water Saturation

Part of the connate water found in oil sands is held in the reservoir by surface tension. Regardless of how long oil is withdrawn from the sand, there is a minimum amount of water which will stay in it. This amount will be called here the "minimum water saturation."

Consider a sand whose pore space is entirely occupied by oil and water, and suppose that the water saturation is progressively increased from the minimum value defined above to higher values. For values slightly greater than the minimum water saturation, no water, but only oil, will be produced, provided a reasonable pressure distribution is maintained in the sand and in the bore hole. When the amount of

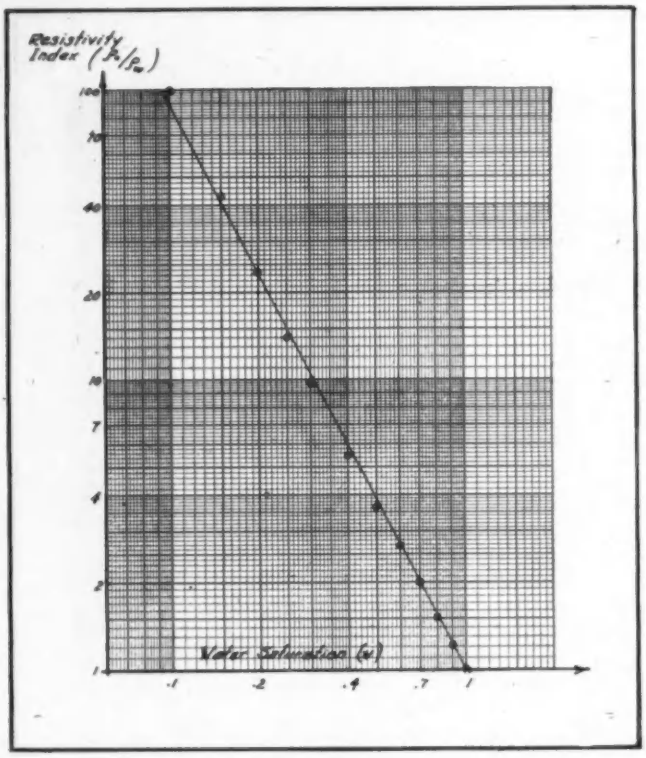


FIGURE 13-2

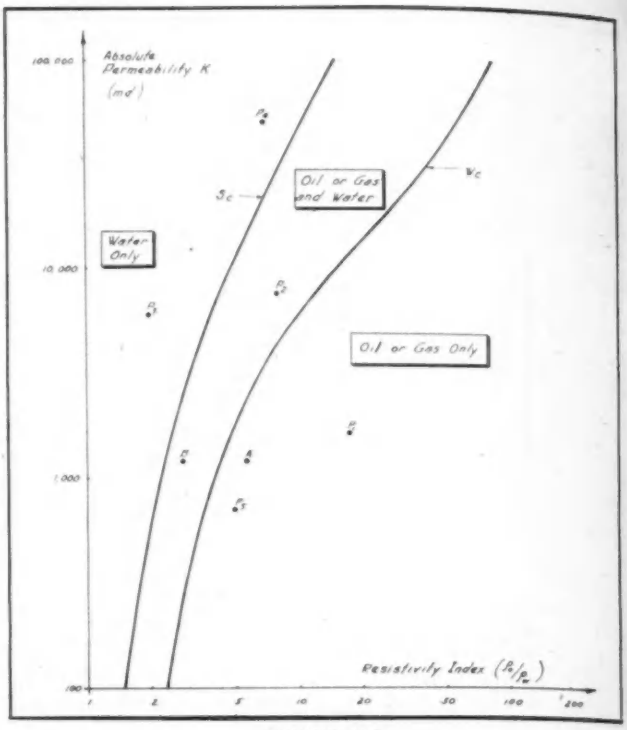


FIGURE 13-3

Production diagnosis as a function of permeability and resistivity index (hypothetical)

connate water is increased further, a point will be reached where water will be produced with the oil. The corresponding water saturation fraction W_c will be called "critical water saturation." If the amount of water is increased beyond W_c, there will be another point beyond which oil production will stop entirely and only water will flow from the sand. The corresponding oil saturation can be called "critical oil saturation," and it corresponds to the point where the effective permeability of the sand to oil equals zero.

The value of the minimum water saturation of any given sand being controlled by the surface tension of the water, it is obvious that it will be a function of the size of the sand grains, therefore of the permeability. The same remark can be made regarding the critical water saturation. This can be expressed by the following relation:

$$W_c = f\ (K) \qquad (13\text{-}4)$$

where K is the absolute permeability of the sand. Theoretically, the function f will vary from sand to sand. However, it is likely that, for all practical purposes, a function can be found to represent reasonably well the critical water saturation of almost any sand, just as formula (13-1) seems in practice to be applicable to most common reservoirs. Eliminating W_c between equations (13-1) and (13-4) gives a relation between permeability and resistivity index of the form.

$$K_c = F\left(\frac{\rho_o}{\rho_w}\right) \qquad (13\text{-}5)$$

Critical Permeability

The subscript "c" has been affixed to the permeability symbol of formula (13-5) as a reminder that a critical condition exists. In fact, for any given value of resistivity index $\frac{\rho_o}{\rho_w}$, the corresponding value K_c given by equation (13-5) refers to the permeability below which oil without water can be produced. For the sake of simplicity, this value K_c will be called "critical permeability." Of course, the critical permeability is closely related to the critical water saturation.

To facilitate the following discussion, it will be arbitrarily assumed that equation (13-5) can be represented by a curve such as W_c shown on Figure 13-3.

An identical discussion would give a similar relation corresponding to the permeability value beyond which no oil, but only water can be produced. This permeability value is evidently related to the critical oil saturation. This relation has been arbitrarily represented by the curve S_c shown on Figure 13-3.

It is clear from the preceding discussion that, if the resistivity index and the permeability of a sand give a point P_1 which falls below curve W_c, oil without water will be produced, regardless of the magnitude of the resistivity index, as long as a reasonable pressure distribution prevails. On the other hand, if the representative point P_2 falls between curves S_c and W_c, oil and water will be produced simultaneously, whereas only water will be produced if the representative point P_3 is above curve S_c.

Figure (13-3) shows that, theoretically, good oil production can be obtained even with extremely low resistivity indexes, provided the reservoir permeability is not too great. A well, therefore, should never be abandoned on the strength of low resistivities, unless it has been ascertained that the formations under investigation have relatively high permeabilities. This applies particularly to very silty sands.

It can happen that the abscissa of a point such as P_4 in the water region of Figure 13-3 is larger than the abscissa of a point P_5 situated in the oil region. This means that good oil production can be obtained from a sand having a certain resistivity index, whereas only water might be produced from a sand having a larger resistivity index. This fact shows that the restistivity index, when considered alone, is sometimes not sufficient to indicate definitely whether a sand will produce oil. For reliable interpretations, other reservoir characteristics must be taken into consideration, as a rule.

From the preceding discussion it is easy to understand that an accurate interpretation of electric logs cannot be obtained usually by a mere inspection of the resistance curves. All pertinent factors must be taken into consideration.

As far as the writer knows, no investigations have been conducted as yet to ascertain whether or not a definite relation, such as equation (13-5), exists between critical permeability and resistivity index. Part of the preceding discussion is therefore hypothetical. It is based, however, on sound data, and is a logical consequence of other proven relationships existing between certain characteristics of sands.

Figure 13-3 represents only one critical curve W_c which corresponds to a certain group of sands. In fact, it is probable that a complete investigation of the problem would show that, in practice, all usual reservoir conditions can be reasonably well represented by only one curve, just as only one curve (Figure 13-1) seems to represent satisfactorily the important relation existing between resistivity and oil saturation.

Silty Sands

There is nothing in the preceding analysis which bars the application of formulas (13-1) or (13-3) to sands containing silt, and even to pure shale reservoirs. Therefore, no particular discussion is necessary for this type of

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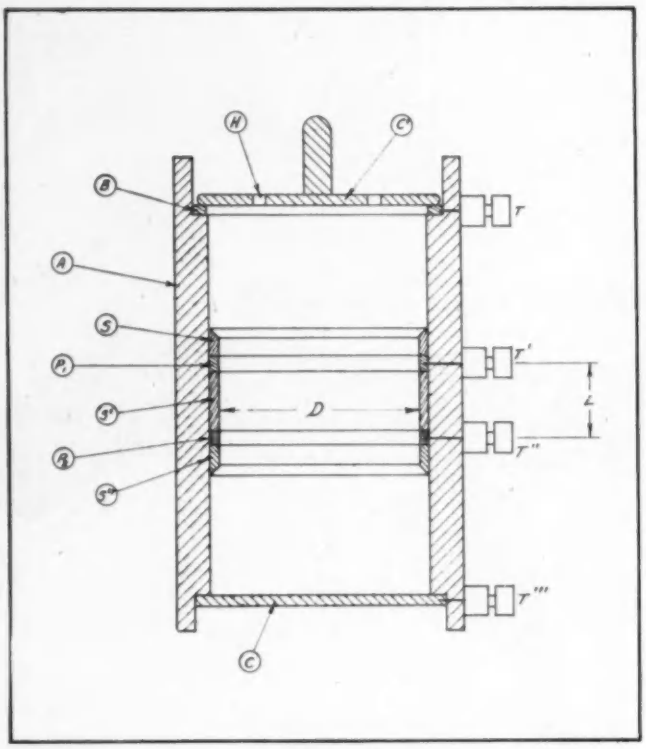

FIGURE 13-4
Mud Cell

formation. An important remark will, nevertheless, be made.

Silty sands are reservoirs which comprise extremely fine solid materials. Their critical water saturation has usually higher values than that of sands which contain only a small amount of silt. On the average, silty sands capable of producing pipe-line oil will contain more water than clean sands, and their average resistivity will be less than the average resistivity of clean sands. Oil production, without water, is often obtained from very silty sands or from very fine grain sands containing 50 percent water, which corresponds to a resistivity index of 3.7. Therefore, sands which exhibit very low index values should not be considered as unable to produce, until it has been ascertained that they are coarse or medium grain sands containing only a small amount of silt.

It is probable that the resistivity of highly cemented oil reservoirs can be expressed by a formula analogous to equation (13-3), if not by this very equation. For the qualitative discussion which follows, this equation will be considered as being approximately correct. To avoid circumlocution, the reservoir will be called "sand," although it might be a highly cemented sandstone, and even sometimes a lime.

The accuracy of determining, from an electric log, the presence of oil in commercial quantity in a reservoir, is primarily a function of the accuracy with which the resistivity index $\frac{\rho_o}{\rho_w}$ is obtained. It has been seen that ρ_o, the true resistivity of the sand, is usually not given by mere inspection of the electric log. A correction, in general, is necessary. The higher the resistivity of the sand, the larger and more inaccurate this correction is. Highly cemented sands are characterized by a large cementation factor, and a small porosity; their resistivity always exhibits high values. Frequently, it will not be possible to determine accurately the resistivity index of this kind of reservoir. Consequently, the detection of oil is always more difficult in cemented sands than in non-cemented ones. In practice, it sometimes happens that the true resistivity of the object bed cannot be determined with enough accuracy to give a reliable value of resistivity index. In such cases, the method of interpretation outlined above usually fails. It is obvious that a purly empirical interpretation would fail also.

Oil Sands and Water Sands

It has been shown in a preceding article that a relation exists between the resistivity ρ_w of a water sand, the resistivity R_w of its water, and its effective porosity fraction P. This relation is

$$\frac{\rho_w}{R_w} = P^{-m} = F \qquad (13\text{-}6)$$

where m is the cementation factor, whose value ranges between 1.3 and more than 2 according to the character of the sand, and F is the formation factor.

Suppose that as far as its resistivity is concerned, an oil sand may be considered as being a water sand in which part of the conductive fluid, the water, has been replaced by a non-conductive material, the oil. An oil sand of effective porosity P and of resistivity ρ_o would then be the equivalent of a water sand of effective porosity PW, W being the water saturation fraction. Applying equation (13-6) to this hypothetical sand gives

$$\frac{\rho_o}{R_w} = (PW)^{-m} \qquad (13\text{-}7)$$

Dividing (13-7) by (13-6) yields:

$$\frac{\rho_o}{\rho_w} = W^{-m}$$

By comparing this latter equation with equation (13-1) it can be seen that they are identical if $m = 2$. Therefore, as far as resistivity is concerned, an oil sand may be considered as being a water sand whose pore space is the space occupied by the connate water, and whose cementation factor is approximately equal to 2.

From Wyckoff's investigations it seems that the resistivity of gas sands is approximately the same as that of oil sands, all other factors remaining the same. Therefore, it is probably impossible to distinguish between oil and gas-bearing formations from an electric log.

Two fundamental methods of interpretation of resistance curves for the detection of oil or gas are available. The first method, which can be called "empirical interpretation" is the method which is generally used at present. It is based on the experience gathered on the area, on the examination of samples, on drill stem tests, and on the chances that the oil operator is willing to take. This method is usually successful and, therefore, sufficient in most field wells. On the other hand, it is much less reliable for exploratory wells, and even sometimes for wells drilled within the limits of certain pools because of stratigraphic or lithological complexity (many fields of South Texas, for example). In such cases, it brings indecision and often results in unnecessary expense. Furthermore, oil or gas sands are sometimes mistaken for water-bearing formations. No general recommendation can be made here for the application of this method, because the reservoir characteristics, and therefore the electric log, change too much from area to area; as a rule each field must be considered individually. Those whose duty it is to interpret the logs have usually much data and experience on the area and are therefore better qualified than anyone else for the detection of oil from the resistance curves, especially if they understand fairly well how to determine approximately the true resistivity values.

The second method, which can be called "physical interpretation," is probably used only by a limited number of oil operators at present. This method bases all interpretations on the relations existing between the electrical and the other characteristics of the reservoirs. Local knowledge, although extremely valuable by itself, is subordinated to the physical investigation and used mostly to supplement it. The fundamentals of this technique have been outlined above. Its application will be reviewed now.

Physical Interpretation

It will be assumed that equation (13-3) and the curve of Figure 13-1 may be applied to the reservoir under consideration. If it is found that a different expression is preferable, this of course, should be used instead of formula (13-3). However, as it is probable that a satisfactory expression for the oil saturation S can be made primarily dependent upon the resistivity index $\frac{\rho_o}{\rho_w}$ only, the following discussion is applicable to any reservoir, at least qualitatively.

Equation (13-3) shows that the oil saturation is a function of the ratio $\frac{\rho_o}{\rho_w}$ only; this in turn, is a function of ρ_o, the true resistivity of the sand, and ρ_w, the resistivity which this sand would have if it would contain only water. A method for determining ρ_o has been given in previous articles. Consequently, the problem with which we are concerned now will be solved when ρ_w is known.

There are several possible methods for determining ρ_w. The best procedure is not always applicable, however. It is, then, advisable to be familiar with all the known methods. This will not only enable one to evaluate ρ_w under practically any condition, but it will also permit one to check the results of one method against that of another, which is extremely desirable.

The factor ρ_w can be determined either directly or indirectly.

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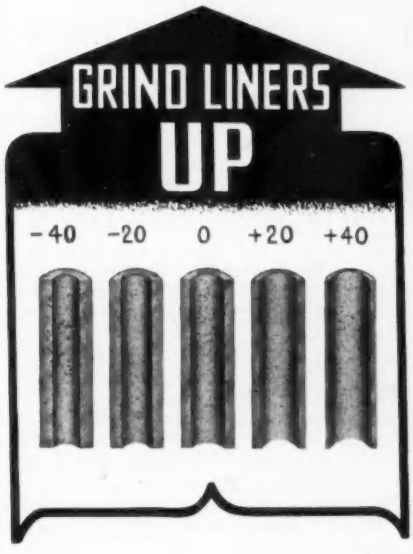

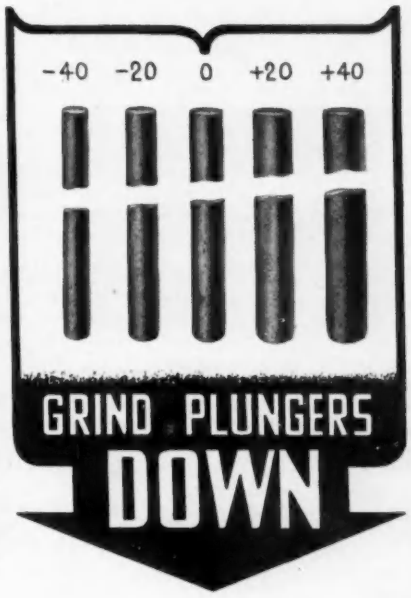

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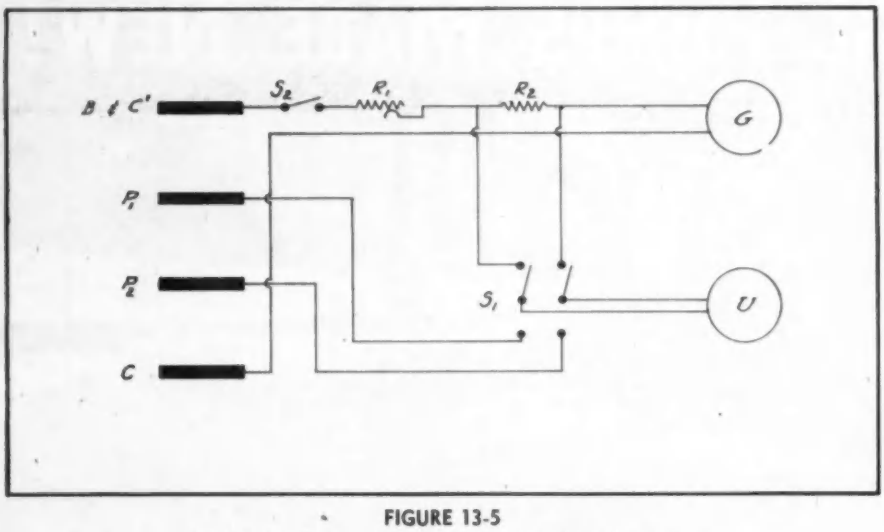

FIGURE 13-5

Circuit arrangement for testing water and sand samples

wells where the object bed is entirely water bearing. The true resistivity of the bed, then, gives directly the numerical value of ρ_w. This figure can be used in neighboring wells, and sometimes even in neighboring fields, when it is known that the character of the said does not change between locations.

If the salinity of formation waters does not vary over long distances, this value of ρ_w can be used without correction. If the salinity of the water changes appreciably, a correction should, of course, be made. This requires the knowledge of the resistivity (or salinity) of the water of the sand which gave ρ_w, and of that of the sand under investigation.

This method for determining ρ_w is useful and simple when several wildcat wells are, or have been drilled in the same area. In this case, the interpretation procedure consists first in establishing correlations between wells. Then the resistivity of every sand of the well under survey is compared to the same sand of the wells known, or assumed, to be dry. Any increase in resistivity of 300 percent or more (resistivity index of 3) should be carefully investigated.

Another simple method for determining ρ_w is to average the resistance values found in the water sands situated a short distance above and below the bed under investigation. If the character of the sands of a section is known to vary only little, this method is both reliable and simple. It is the procedure followed intuitively by those who use the empirical interpretation method mentioned previously.

Indirect Determination of ρ_w

Referring to equation (13-6) it can be seen that ρ_w can be expressed as follows:

$$\rho_w = FR_w$$

which shows that ρ_w can be determined when R_w, the resistivity of the formation water, and F, the formation factor, are known.

If a sample of the water is available (from drill stem test, or water produced in other wells from the same horizon), a simple electric test of the water will yield the value of R_w. If no sample is obtained, but if a catalogue of the water salinities of the region is available, then R_w can be determined with sufficient accuracy by referring to chart 12-1 (see Part 12, The Oil Weekly, October 30, 1944). A representative value of R_w is usually easy to obtain, and the most difficult part of the problem lies, in general, in the determination of the formation factor.

Temperature Correction. When computing the resistivity index from the values of ρ_o and ρ_w, it is necessary to use numerical values referred to the same temperature. The temperature T of the formation situated at any depth in a given area is usually fairly well known. ρ_o, the resistivity of the bed determined from the electric log corresponds to this temperature T. A correction should then be made so that ρ_w, the resistivity of the water saturated sand, corresponds to the same temperature. The chart of Figure 12-1 given in a preceding article can be used for this purpose.

Determination of Formation Factor

The formation factor can be determined accurately when a representative sample of the bed under investigation is available. In practice, a conventional core is the best material to use for this determinaiton. The question can, then, be asked. Why use an elaborate method of interpretation if a good sample of the reservoir is available for inspection and analysis? The reason for doing so, regardless of the result of the analysis, is that a sample brought to the surface is rarely representative of the conditions existing in situ. In fact, it often happens that no appreciable saturation is detected in a good size core although the sand under investigation carries petroleum in commercial quantities. The opposite case is not infrequent; i. e., many cores which exhibit a good oil saturation are unable to produce anything except water, because the saturation is less than the critical value. In these two cases, an interpretation based on the method outlined above would give more accurate information. Therefore, it would often prevent either making unnecessary tests, or abandoning a well which would make a good producer. This shows that a core, in spite of its limitations, is a valuable material for the determination of the presence of petroleum provided it is tested right.

Even when reliable information on the fluids in situ is obtained from a core by conventional analysis methods, this sample is of great value for determining the electrical characteristic of the reservoir. This information is extremely useful in the areas where the sands are rather uniform, because it can be used as a yardstick either in neighboring wells, or in deeper sections of the same well, and prevent expensive coring.

Conventional cores of average size are ideal samples for this type of investigation because reliable electric tests can be made on them as easily as other physical tests such as porosity and permeability. The measurement of the formation factor on these samples will be discussed later in this article.

Samples of smaller size (broken conventional cores, small side wall samples) are usually less satisfactory, because they do not lend themselves to accurate electric tests. The electrical characteristics of the reservoir cannot be determined directly from such samples, and an indirect method must be resorted to. This is based on the application of the following formula:

$$F = P^{-m}$$

where F is the formation factor, P the porosity fraction and m the consolidation factor (see Part 12, The Oil Weekly, October 30, 1944). F is entirely determined when the value of P and that of m are known.

Usually, the porosity cannot be determined by mere inspection of the sample and it must be measured directly by one of the conventional methods. On the other hand, the consolidation factor is, in general, easy to determine by microscopic inspection or other methods, especially if the sand is found to have negligible cementation, in which case a value of 1.3 may be used.

Previous statements regarding the reliability of conventional cores for production diagnosis apply, of course, to side wall samples. The latter are usually much more valuable for the determination of the electrical characteristics of reservoirs than for a direct detection of oil.

When no sample is obtainable, then it is necessary to use data available from other wells, or data from the same well but related to sands situated above or below the object bed, provided it is known that an extrapolation is warranted.

A catalogue of the electrical characteristics of the reservoirs of an area, if available, would prove of considerable value for the interpretation of the resistance curves obtained in this particular territory when no good samples are available. This, of course, would necessitate considerable effort and time, but would certainly prove beneficial in the long run.

Measurement of Formation Factor

The best method for determining accurately the value of the formation factor is to make an actual test on a representative sample of sufficient size. The equipment necessary to carry out this measurement is easy to build and to operate. This electrical testing is not more complicated than other physical measurements made on cores, such as permeability and porosity, and there is no reason why it should not be made an integral part of a routine core analysis.

The principle of the method is based on the application of the following formula:

$$F = \frac{\rho_w}{R_w}$$

which shows that the formation factor

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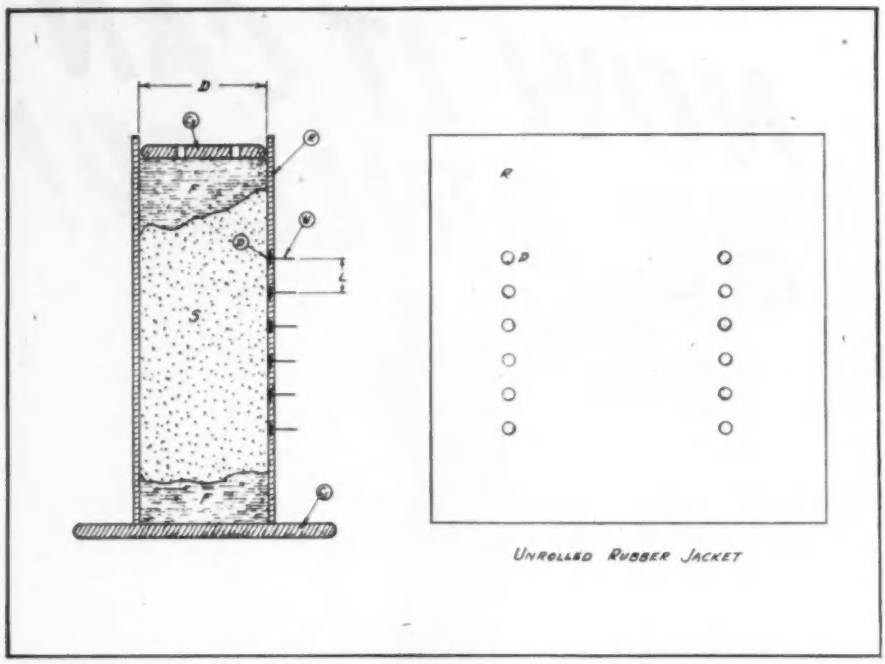

FIGURE 13-6
Core testing

F will be known when ρ_w, the resistivity of the sand filled with any water, and R_w, the resistivity of this water are known.

Preparation of the Sample. If the sand sample is large enough (several cubic inches), the first step is to cut it to a regular geometrical size—preferably a right circular cylinder—without disturbing the original packing. If a conventional core is available, the only dressing to be done is to shape its ends so that they are roughly flat and approximately perpendicular to the axis of the core. A perfect facing is not necessary as will be shown later. Unnecessary attempts to obtain flat surfaces might damage the sample and should therefore be avoided. It is always advisable to use as large samples as possible in order to obtain good representative results. The diameter of the sample should be measured accurately. Its length need not be known.

Testing of the Solution. As sodium chloride is the main constituent of most formation waters, and as it is easily available, its use is recommended for the preparation of the soaking solution. In practice, a solution as concentrated as the usual formation water (50,000 parts per million or more) cannot be conveniently used, because it is so conductive that it renders accurate electrical measurements difficult unless an unnecessarily elaborate equipment is used. Better results are obtained by using tap water in which approximately 2 to 5 grams of salt per liter are dissolved. This gives a solution having a resistivity comprised between 1 and 3 ohm-m at room temperature.

The resistivity of the solution should be measured, and not determined from the chart of Figure 12-1 because of many possible sources of error. The exact salt concentration in the solution therefore need not be known. The water resistivity measurement is made with a mud cell. A convenient cell is shown on Figure 13-4 in cross section. A is a bakelite tube 5 inches long and 3 inches in diameter containing two current electrodes and two potential measuring electrodes. C, one of the current electrodes, is a brass plate which forms the bottom of the cell. It is press fitted in the bakelite tube. P_1 and P_2, the potential measuring electrodes, are brass rings set one inch apart. They are placed between bakelite spacers S, S′ and S″ in order to insure a uniform diameter of the water situated in the vicinity of the potential measuring electrodes. C′, the second current electrode is a brass plate resting on a brass ring B. The purpose of ring B is to connect C′ to the current source. Plate C′ forms the removable lid of the cell. Several small overflow holes H have been provided in this plate. B, P_1, P_2 and C are electrically connected to terminal posts T, T′, T″, and T‴, respectively. When the cell is filled with the solution to be tested, C and B are connected to a current supply, and the resulting potential difference V existing between P_1 and P_2 is measured with a voltmeter. The application of Ohm's law to the section of the circuit between P_1 and P_2 gives (see Part 2, THE OIL WEEKLY, August 14, 1944)

$$V = R_w \frac{4L}{\pi D^2} \times I$$

or,

$$R_w = \frac{\pi D^2}{4L} \times \frac{V}{I} \qquad (13\text{-}8)$$

where

R_w is the resistivity of the water (ohm-m),
V the potential difference between P_1 and P_2 (volts),
I the current flowing in the cell (amperes),
D the inside diameter of the rings P_1, P_2 (meters),
L the separation P_1, P_2 (meters)

D and L are measured once for all. V and I have to be measured for each sample of water.

In order to prevent introduction of errors due to polarization, alternating current should be used, 60 cycles for example.

A convenient circuit arrangement for the electrical measurements is shown on Figure 13-5. The current circuit consists of the source G, two resistors R_1 and R_2, a switch S_2 and the two electrodes C and C′: the circuit is closed through the water contained in the cell. R_1 is a variable resistor, and its value is large enough (10,000 ohms, for example) so that a current of only a few milliamperes will flow in the circuit, say 10 ma. The purpose of resistor R_2 is to provide a convenient method for determining the intensity of the current I flowing in the circuit. This is done by measurng the voltage across R_2 and applying Ohm's law. R_2 is, for instance, of the order of 1000 ohms. The terminals of this resistor are connected to one of the positions of a double pole-double throw switch S_1, the other position of which is connected to the potential measuring electrodes P_1 P_2. The poles of switch S_1 are connected to an a-c voltmeter U of high internal resistance. The use of the switch S_1 permits a convenient and rapid measurement and checking of V and I.

Once these two factors are obtained, R_w is computed by application of equation (13-8).

Testing of the Sample. The sample S, which supposedly contains no oil, should be saturated with the solution before it is electrically tested. A procedure which has been found to be satisfactory for sands, consists in rolling the sample (assumed to be cylindrical) in a sheet of rubber R about 2 mm. thick provided with one or two rows of electrodes, as shown on Figure 13-6. These electrodes are thin brass disks D set flush in the rubber and spaced 10 mm. They are 3 millimeters in diameter and are electrically connected to insulated wires W.

Loose absorbent cotton F is placed at each end of the sample in order to provide surfaces which are approximately flat. The sample is set vertically and placed below a pipette from which the testing solution is allowed to drip long enough so that all the original water has been displaced, and all the salts which the sample might contain have been eliminated. The wrapped sample is then placed in a container filled with the testing solution, and a vacuum is applied in order to drive the gases entirely out of the sample. During the preceding operations, the sample is turned upside down several times. The foregoing procedure has been found convenient for samples of high permeability. When low permeability cores are to be tested the process is slow, and the flushing of the sample can be made under pressure.

The sample is now ready for the electric test. Still in its rubber jacket, it is placed on a brass plate C_1 and capped by a brass lid C_2, as shown by Figure 13-6. Care should be taken that the bottom cotton and the plate C_1 provide as good a seal as possible in order to reduce the loss in water to a minimum during the measurement. In this connection it is advisable to drop occasionally a little amount of the solution on the top of the sample in order to be certain that it remains saturated. The resulting flow of solution through the sand during the measurement does not introduce any error.

The measurement of the resistivity of the water saturated sand is determined in exactly the same manner as R_w was

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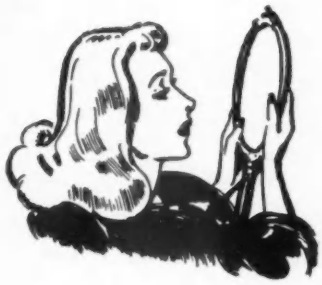

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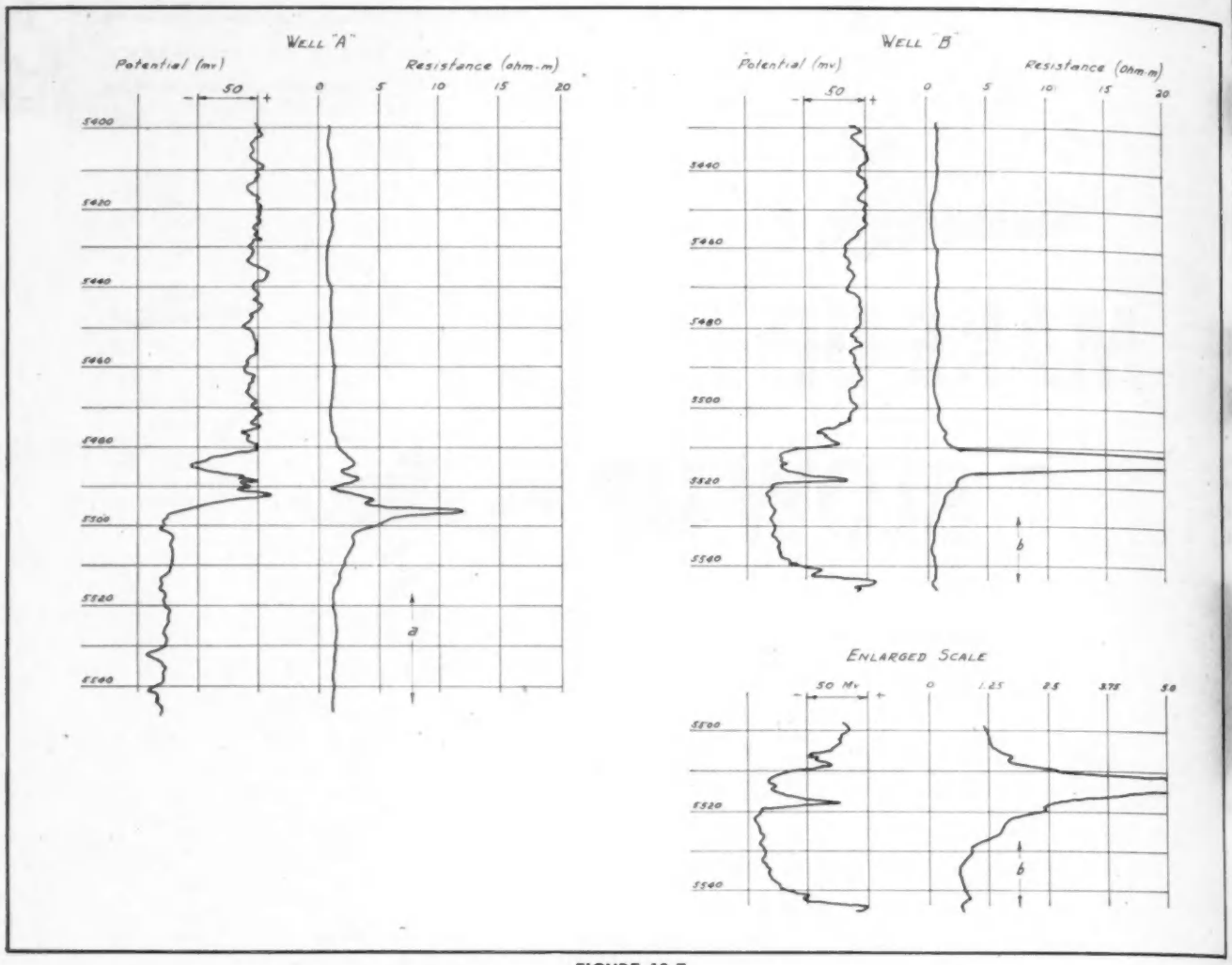

FIGURE 13-7
Electric log of two wells in the Withers field, Texas Gulf Coast (Courtesy McDannald Oil Company)

obtained with the mud cell. Equation (13-8) is used, but of course, it gives the value of ρ_w instead of the value of R_w provided the dimensions L and D used in the equation are those of the sample. C_1 and C_2 should be used as current electrodes, and any pair of disks D as potential measuring electrodes. In order to ascertain the uniformity of the sample, it is recommended that a set of measurements be made between each consecutive pair of disks. The resulting values of R_w are averaged, and the figure obtained is used for the computation of F, rather than any particular value.

If the faces of the samples are appreciably tilted, as shown, for instance, on the top of the sample of Figure 13-6, measurements made by using the extreme disks D should not be used because of possible current distortion.

The foregoing descriptions have been given only as illustrations. Different techniques and instruments giving satisfactory results can of course be used for the preparation and testing of the samples. However, it is recommended that the four-terminal method be used for the resistance measurements rather than the conventional two-terminal procedure mentioned sometimes in the literature. Many sources of errors are thus eliminated.

Effect of Temperature. In order to insure good results it is necessary that a current not larger than 50 milliamperes be used, and that this current be kept flowing only during actual measurements of V and I. Doing otherwise would heat the core and would necessitate a temperature correction, the amount of which is difficult to ascertain. An excessive current used during a long time would also cause an appreciable electrolysis of the solution, and replace it partly by a non-conducting fluid (gas), which of course would introduce errors.

The factors ρ_w and R_w should always be measured with the samples at the same temperature.

Example

An example of application of the preceding method will now be given. Figure 13-7 represents the electric logs obtained on two wells, A and B, of the Withers, Texas, Gulf Coast field. The top part of the sand section does not offer any problem, because local knowledge has taught that this sand (Frio) is relatively uniform, both vertically and horizontally over an area of several hundred square miles, and that a resistivity of several ohms is a positive indication of oil or gas production. The lower section of the sand, however, exhibits a very low resistivity, and a casual inspection of the logs made by a layman would usually condemn it. This is a case where the method described above can be profitably applied.

The sections under investigation are thick and essentially uniform. Their resistivity is of the same order as that of the mud. The spacing used is sufficiently long so that the readings are not affected by mud invasion. In other words, no correction is necessary, and the true resistivity equals nearly the apparent resistivity.

The average characteristics of this reservoir have been found to be as follows:

Porosity—.31

Permeability—1200 millidarcies

Water—90,000 milligrams per liter, mostly sodium chloride

Sand Character — Loosely consolidated, fairly uniform grains (typical histograms are shown on Figure 13-8)

A consolidation factor m of 1.3 can be used (no cementation) which gives for the formation factor F the following value:

$$F = P^{-m} = 4.55$$

At a depth of 5500 feet, the temperature is approximately 120 degrees Fahrenheit. A water containing 90,000 milligrams per liter of salts (mostly sodium chloride) has a resistivity R_w of 0.058 ohm-m at this temperature (see Figure 12-1, Part 12, THE OIL WEEKLY, October 30, 1944). The resistivity of the sand

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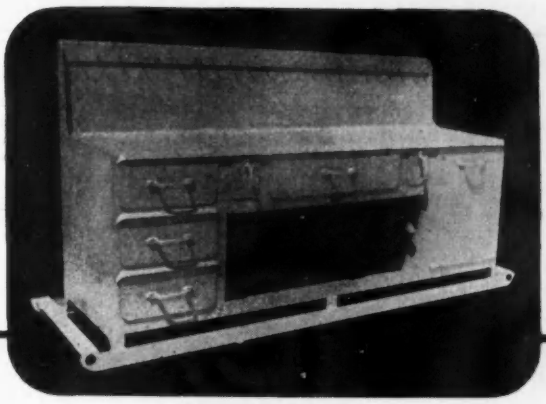

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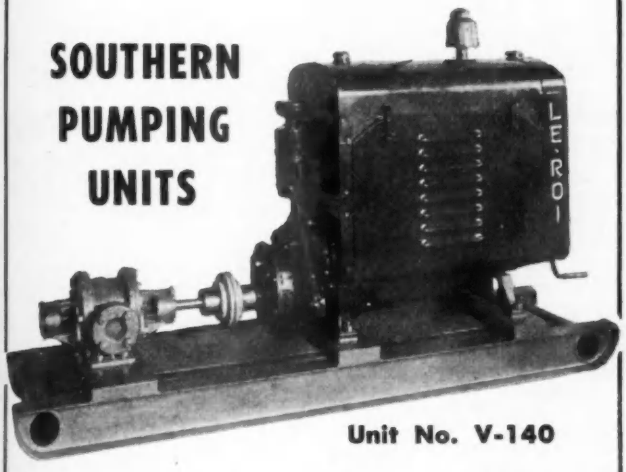

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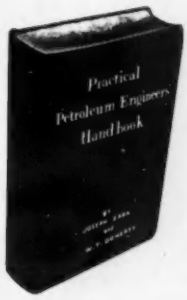

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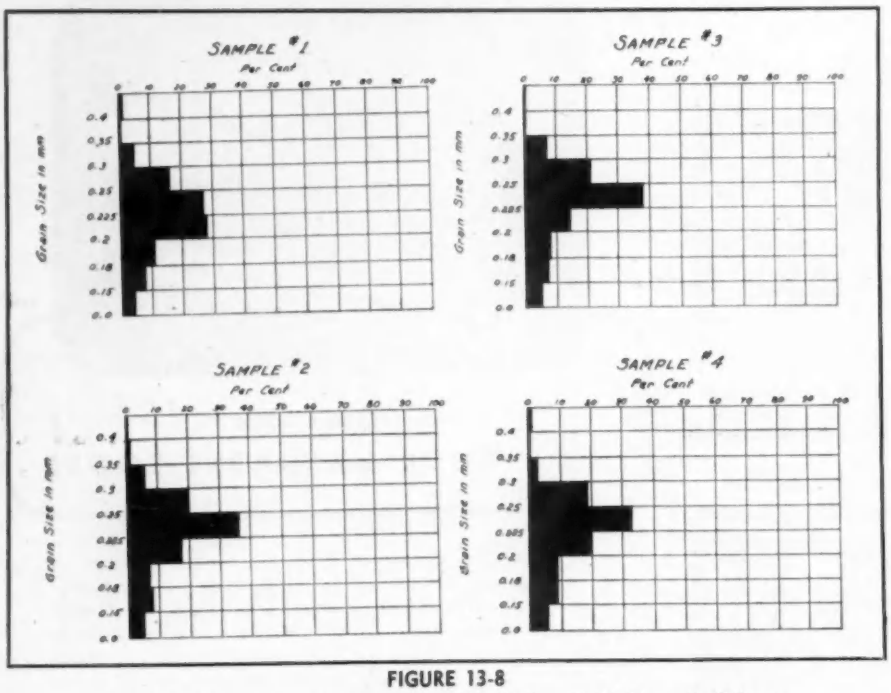

FIGURE 13-8

Typical histograms of the Frio sand in the Withers field, Texas Gulf Coast (Courtesy McDannald Oil Company)

under survey, when filled entirely with water, is therefore

$$\rho_w = FR_w = 0.265$$

In well A, the true resistivity of section "a" averages 1.3 ohms. In well B, the true resistivity of section "b" averages 0.75 ohm (see enlarged scale). These figures give the following resistivity indexes:

$$\frac{1.5}{0.265} = 5.65 \text{ for "a"}$$

$$\frac{0.75}{0.265} = 2.85 \text{ for "b"}$$

Referring to Figure 13-1, this gives the following approximate oil or gas saturation values:

61 percent for "a" (Well A)
43 percent for "b" (well B)

These figures show that there is a good probability of production for well A, but a doubtful possibility for well B. This is confirmed by the following production data: Section "a" is producing gas without water, whereas section "b" is producing some oil with a large amount of water.

The foregoing procedure can be profitably used also to accumulate data with a view to establish experimentally curves W_e and S_e of Figure 13-3. The resistivity indexes (5.65 and 2.85) and the permeability (1200 md) give points A and B on this figure. From the foregoing production data, curve W_e should then pass between these two points. If enough similar reliable data were at hand, the critical curves W_e and S_e of Figure 13-3 could be obtained with enough accuracy by this method to serve most practical purposes.

Summary

The resistivity of a permeable bed is controlled entirely by the characteristics of the reservoir and of its fluids. The possibility of producing oil or gas from a bed is controlled by the same factors. Nevertheless, it is not possible to determine directly the possibility of production from the resistivity of the bed, because there is no unique relation between these two factors. An intermediate analysis of the physical characteristics of the reservoir is necessary.

The problem of translating resistivity data into terms of petroleum production data will be solved, at least in theory, when a chart, or a set of charts, of the type shown on Figure 13-3 is available. At present, a less perfect, but quite satisfactory, solution is available with the graph of Figure 13-1. The validity of this graph over a wide range of reservoir types has not been ascertained as yet and quantitative determinations from this graph are not warranted at the present time. However, it is probably safe to use it for qualitative diagnosis.

The use of this graph requires the knowledge of two factors:

1. The true resistivity of the object bed, ρ_o. This is given by the electric log after a correction has been made.

2. The resistivity ρ_w which this bed would have if it were filled entirely with formation water. This can be determined by one or several of the following methods, according to the nature of the available data.

A. If an electric log is available for a section where the object bed is known to carry only water (either at a lower level in the same well, or in a neighboring well), then ρ_w equals the true resistivity of this section.

B. If a large size sample (conventional core) of the reservoir is available, and if the salinity or the resistivity of the formation water is known, then an electrical test made on the sample will permit determining the factor F, from which ρ_w is calculated.

C. If a small size sample (side wall core, cuttings) is available, and if the salinity or the resistivity of the formation water is known, an indirect method is used: the porosity of the sample is measured, and the consolidation factor is determined by microscopic inspection, acid and hardness test, etc. An approximate value of F, and therefore of ρ_w, can thus be obtained.

D. If no sample is available, lithological data from neighboring wells and from overlying and underlying permeable formations of the same well must be interpolated or extrapolated. Data on the salinity or the resistivity of the formation water is necessary also. If not available, it can be determined by interpolation, or local knowledge. A catalogue containing all this information could be used if and when available. In this connection, it should be realized that the value of any core or sample, regardless of its contents, should not be underestimated. These samples may be discarded only when all the pertinent physical data have been obtained from them and entered in catalogues.

Conclusion

A rational method for the interpretation of electric logs has been outlined. Many readers will probably be disappointed to realize that no general rule for a direct and easy interpretation is offered. It is conceded that the procedure described is not simple, neither in theory nor in practice, but this should be expected when the complexity of petroleum reservoirs is remembered.

It is realized that the method has not been adequately nor fully presented here. In fact, it is still in its very early stage of development and considerable work will be necessary to perfect and understand it fully. If the preceding mostly quantitative discussion helps to arouse greater interest on the subject: one of the purposes of this article will have been fulfilled.

It seems that the method would prove valuable if complete and accurate data on the following points were available:

1. Static characteristics, for instance, relation between saturation and resistivity.

2. Dynamic characteristics, for instance, relation between permeability—or average grain size[8]—and resistivity.

3. Statistical information, such as catalogues of porosity, permeability, formation factor, consolidation factor, water salinity or resistivity, temperature, etc.

If such data were at hand, the interpretation of electric logs would become mainly a matter of referring to a few charts or tables. At the present time this goal is far from being attained.

ACKNOWLEDGEMENTS

The writer wishes to express his appreciation to "The Petroleum Engineer," to the American Institute of Mining and Metallurgical Engineers and to the University of Chicago Press, who gave permission to quote from their publications. He is also indebted to the McDannald Oil Company for its release of the electric logs presented.

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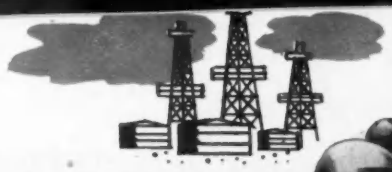

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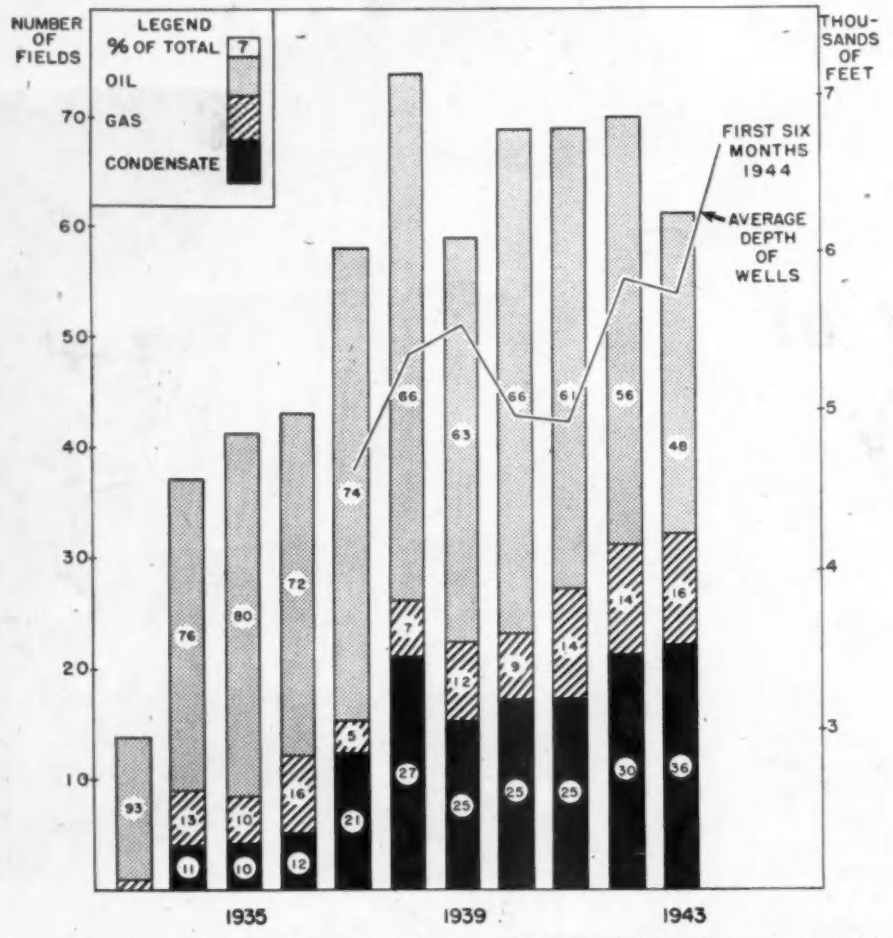

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of discovery, production, transportation and storage of our natural gaseous hydrocarbons." In addition, science "is converting this increasingly valuable natural resource into newer and super forms of energy and into varied chemical ingredients from which may be derived amazing products—products that will allow us to be victorious and to continue in our way of life with better health and greater happiness. Thus natural gas, once looked upon with scorn, avoided and intentionally wasted, now takes its place beside its twin, petroleum in comparative value."

Used in Aviation Fuels

In the production of aviation fuel, the petroleum scientist is a major contributor to the success of our war effort. Advances in refining techniques are responsible for these fuels: The property of "rich mixture rating," accompanied by "lean mixture rating," gives to high-octane fuel maximum power at full throttle and also enables the power unit to operate efficiently when cruising to and from the target or battle area. "Thus into one fuel is blended ingredients to insure the power and effciency, prerequisites in all phases of modern aerial warfare. To effect this, the liquid fuel to power our planes consists of a definite blend of base stock, iso-octane alkylate, isopentane, tetraethyl lead, ethylene dibromide, together with additives of moré recent perfection, like cumene, 2,3 dimethyl butane and others that cannot be reported due to restrictions. Natural gas, continues as one of the major sources for the production of these super-quality ingredients, even though it is not the bulk raw material of the present aviation fuels.

Improving Rubber

Products extracted from natural gas are presently employed in about 13 percent of the authorized rated plant capacity for making butadiene, the chief ingredient of synthetic rubber. In the production of other rubber "musts," however, like styrene fillers such as carbon black, natural gas plays a prominent part, especially in the latter. In order to produce the desired strength and wearing properties necessary in synthetic rubber, science has developed carbon black to the point where the tensile strength of synthetic rubber is increased by 600 percent. New processes whereby carbon black slurry is added to the liquid rubber produces a finished rubber with perfect distribution — a natural rather than a mechanical blend. "This achievement, together with a reported new con-

tinuous polymerization process, has the possibility of the greater use of synthetic rubber even after natural rubber is available, because these new processes reduce the cost of synthetics in addition to producing a better product."

Among the latest of these continuous advances, and among the most outstanding, is that of a carbon chain that makes possible the production of electrically conductive rubber. "Thus the dreaded ice formation upon airplane wings may be beter eliminated by electrically heated rubber coverings. Also, electrical conductive products may allow for the dissipation of electric charge heretofore suspected as the cause of unaccounted for accidents.

Immense quantities of explosives required for the war have been possible through the use of natural gas. Formaldehyde, ammonia, and nitric acid are essential to make hexagon, chief explosive in our block busters. Production of these materials from natural gas has speeded our bombing program. "It may be noted, probing more deeply into these accomplishments, that they have been made possible by the development of a process in which natural gas and steam react to produce hydrogen or a mixture of carbon monoxide and hydrogen with amazing overall yields."

Materials for Plastics

This process by which natural gas and steam react to form carbon monoxide, may be a major source of raw materials required for the production of plastics, and synthetic fuels.

Synthetic plastics are fast becoming wartime substitutes for critical materials, while some of them are among the critical materials themselves because of superior qualities for certain specialized uses. Just to what extent natural gas will serve as a major raw material cannot be determined at present, but processes previously referred to suggest that it may be a source of raw material in the production of the important ethenoid and formaldehyde resins. A greater portion of the dry natural gas, chiefly methane, presently being converted into chemicals, finds its major end product explosives, thus the results of such a study are restricted.

Present trends suggest that the heavier fractions, like ethane, propane, and butane, are desirable for chemical processing. In 1943, for instance, an estimated total of 389,127,500 gallons of propane, butanes and butylenes separately and as mixtures, were used as chemical raw material. The requirements for this year were set at 478,022,000 gallons.

Increasing discoveries of gas-condensate reservoirs have called attention to the necessity of proper regulation to prevent undue loss of underground valuable hydrocarbon fractions. In this type of reservoir, "nature has failed to conform with the classic chemical laws." More progressive state regulatory bodies are now cognizant of these problems and are taking steps to insure underground conservation.

☆

JOSEPH GORDON, petroleum consultant of New York, will make a three-weeks trip to Denver, San Francisco and Los Angeles, where he plans to discuss underlying trends in the Rocky Mountain and California oil industries with company officials. Gordon was with PAW until last December.

Opposition to Anglo-American Pact Registered by Gulf Coast Refiners

Opposition to the Anglo-American petroleum agreement is expressed in a resolution announced last week by the Gulf Coast Refiners Association, Houston. The following resolution was adopted and sent out by the association, under signature of F. E. Holsten, president, and George Reid, executive secretary:

Resolved that the Gulf Coast Refiners Association go on record as vigorously opposing ratification by the Senate of the United States of the proposed Anglo-American Petroleum Agreement submitted by the President on August 24, 1944, because:

1. It would set up an International Petroleum Commission which would exercise vast control over, and a degree of regulation of, internal affairs never granted to the Congress by the constitution in the field of legislation. And a precedent of granting more power to an international commission than can be exercised by the Congress itself is so dangerous as to constitute a threat to every phase of American business.

2. Any "advisory" body set up to function under conditions of a treaty would inherit, through its sponsorship by the American and British governments, sufficient power to enforce its decisions upon the domestic petroleum industry and would thus secure complete domination of petroleum production, transportation, refining and marketing in this country and on a world-wide basis to the ultimate total elimination of free enterprise.

3. The proposal blandly and improperly assumes that other sovereign nations, owners of petroleum reserves and consumers of petroleum products, will submit to Anglo-American world-wide regulation of the petroleum industry. The interests of other nations are certain to be affected greatly by the proposed regulation.

4. Should one or more other nations join in the ratified agreement, the United States might find that, in matters of national safety and internal regulation, it was out-voted by more numerous foreign representatives. Thus this agreement would result in a delegation of sovereignty and authority, by the Senate, which was never contemplated when the constitution gave it the power to ratify treaties.

5. The wording of the agreement is so vague in many respects that, if ratified as a treaty, the United States may find itself committed, by interpretations of the language, in many respects not now foreseeable.

6. The agreement is unfair, in that it does not apply where "imperial preferences" of the British Empire would suffer; while the agreement would apply where interests of the United States would suffer.

Boyd Asks Early Removal Of Federal Gasoline Tax

Protesting against a proposal for postwar federal taxation of gasoline, W. R. Boyd, Jr., president of American Petroleum Institute, made public today a letter sent to Paul G. Hoffman, chairman of the Committee for Economic Development, whose research committee has suggested that the gasoline levy be retained in the postwar federal tax structure.

Gasoline is not a luxury but a beneficial commodity vital to the economic life of the nation, and a continuation of the emergency levy, Boyd declares, would be a heavy and unfair burden on American motor vehicle owners, whose special automotive taxes exceeded $2,000,000,000 in 1941, the last peace year. "The federal tax on motor fuel raises the cost of the necessities of life provided by the farmer, the grocer, and the trucker, and consequently lowers the general standard of living of the consumer," he declared.

The purely temporary, emergency nature of the present federal gasoline tax is stressed by Boyd, who quoted statements made by members of the House ways and means committee and by the Senate finance committee.

Legislatures of more than half the states, it is pointed out, have petitioned Congress to repeal the levy. The withdrawal of the federal government from the motor vehicle tax field was further recommended by the Committee on Intergovernmental Fiscal Relations on January 1, 1943.

The federal gasoline tax, Boyd continues in his letter to the CED Chairman, has no connection with federal highway aid, which was inaugurated 16 years before adoption of the federal gasoline tax. To make the federal gasoline tax and other automotive excise taxes the basis for the distribution of federal aid, which was instituted to assist the states in building roads for the mails, to advance national defense, and to facilitate interstate commerce, would be most unfortunate for American motorists, he adds.

Removal of the federal tax on gasoline should be, in Boyd's judgment, one of the first steps in the realignment of the postwar federal tax structure. Abolition of this discriminatory levy would relieve low-income groups, encourage business expansion, "apportion the tax burden fairly among persons," and promote employment, he said.

Foremen's Booklet Issued

United States Department of Labor, Division of Labor Standards, Washington, D. C., has issued a booklet called "The Foreman's Guide to Labor Relations." It is for sale by the Superintendent of Documents, Washington, D. C.

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WILLIAM A. TUNSTILL, 68, pioneer independent operator, died at his home in Fort Worth, November 1. A former rancher from Cisco, he had participated in the development of most major oil fields in Texas, outside of the Gulf Coast.

ERLAND J. ANDERSON of Humble Oil and Refining Company has been transferred from the Tomball, Texas, district, to the Livingston, Texas, division as district petroleum engineer.

Brisk Rate of Completions Maintained In October and More Rigs Put Into Use

Drilling continued during October near the high level of the month before, completions having averaged nearly as many per day, and since some extra drilling rigs came into operation, the rate of completing wells likely will be maintained or increased in November.

In the 4 weeks ended October 28, 1944, well completions in the United States averaged 527 per week, compared with this year's high of 539 weekly in September, 495 weekly in August, and 520 weekly in July. The 527 completions per week in October compared with 393 weekly in October of last year.

The current rate of completing wells, in spite of sharp increases this year, is materially under the rate of around 700 per week maintained in the summer and fall of 1941.

This failure to equal the 1941 rate of completions by a large margin may be pointed to in spite of the fact that there are now in operation a record number of drilling rigs—several hundred more than in the fall of 1941. Various causes due to the war are cited in explanation of the present reduced efficiency in drilling.

Rigs in operation on October 31 (or November 1) totaled 4167, a new high, compared with 4032 a month before, 3168 a year previously, and 3975 on the corresponding date of 1941. These figures include wells drilling and rigging up.

Continuation of the October rate of completions to the end of this year would result in a little over 24,000 wells for 1944, the goal of the Petroleum Administration for War, as set up at the beginning of the year, as 20,042 completions are on record for the first 10 months, or 44 weeks ended October 28. Similarly, continuation of the October rate of completions through 1945 would be adequate for achieving the goal of 27,000 completions called for by PAW in its plans for next year.

The 20,042 completions of the first 10 months of this year represented an increase of 27.5 percent over the 15,718 recorded for the like months last year. Almost all states and districts have participated in the expansion of drilling. Noteworthy among the increases in completions are those of 44 percent in California, 44 percent in Texas, 99 percent in Kentucky, 39 percent in South Louisiana, 102 percent in Mississippi, 58 percent in Montana, 48 percent in New Mexico, 41 percent in West Virginia, 40 percent in Wyoming. Other increases include those of 9 percent in Colorado, 9 percent in Illinois, 32 percent in Indiana, 16 percent in Michigan, 68 percent in Missouri, 2 percent in New York, 21 percent in Ohio, 28 percent in Oklahoma, 22 percent in Pennsylvania, and launching of substantial drilling programs in Alabama and Georgia. Among Texas districts, the largest increases in drilling have occurred in West Texas and the upper and lower sections of the Gulf Coast.

Arkansas, North Louisiana, Kansas, Nebraska, Iowa, and Florida are the only states or districts which have had fewer completions this year than last year, and their decreases have been relatively small.

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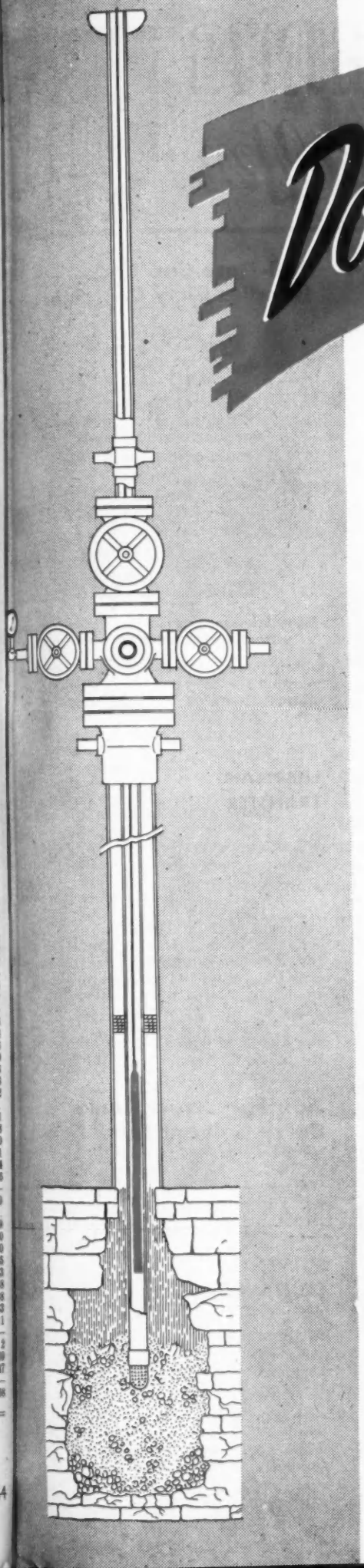
C. H. KEPLINGER has resigned as division petroleum engineer for Shell Oil Company to become an independent consulting petroleum engineer specializing in evaluation work and repressuring.

U. S. Completions in First 10 Months 27.5 Percent Above Last Year

(Figures compiled from weekly reports of editorial staff men, with folowing exceptions; Arkansas data from Arkansas Oil and Gas Commission; Illinois from Illinois Geological Survey except for October; Indiana from Indiana Division of Geology; Missouri from Missouri Geological Survey; Allegany, New York, and Bradford and Kane-Clarendon, Pennsylvania, from the Producer's Monthly; Tennessee from Tennessee Division of Geology.)

State or District	MONTHLY COMPLETIONS: OCTOBER, 1944 — Details for October, 1944 — New Wells *Oil	Gas	Dry	Others[6]	Old Wells Deepened	Total Completions — Oct., 1944[1]	Sept., 1944[3]	Oct., 1943[2]	Total Footage October, 1944	CUMULATIVE COMPLETIONS: First 10 Months — Details, Jan.-Oct., 1944 — New Wells *Oil	Gas	Dry	Others[6]	Old Wells Deepened	Total Completions — Jan.-Oct., 1944[4]	Jan.-Oct., 1943[5]	Percent Change	Total Footage 10 Months 1944	RIG IN OPERATION — Details for Oct. 31, 1944 — Drilling	Rigs Up	Shut Down	Total: Drilling and R. U. — Oct. 31, 1944	Sept. 30, 1944	Oct. 31, 1943
Alabama			2			2	8		9,715	10		21			31	2	+1450.0	153,127	3			3	4	1
Arizona												6			6	4	+ 50.0	16,190						3
Arkansas	14	1	5		1	21	14		118,743	115	5	72		1	193	219	— 11.9	1,104,702	28	2	7	30	36	43
California	156	5	11			172	181		675,470	1,384	29	238		62	1,713	1,187	+ 44.3	6,149,592	336	35	33	371	379	354
Colorado	4					4	2		24,591	17	1	6			24	22	+ 9.0	120,141	12	1	14	13	15	17
Florida			2			2			14,002			3			3	4	— 25.0	19,302	4		2	4	4	1
Georgia			1			1	2		3,850			8			8	2	+300.0	44,028			1		2	
Illinois	106		62	1	11	180	216		446,702	973	5	600	10	59	1,647	1,507	+ 9.3	4,146,396	220	33	16	253	223	186
Indiana	19	6	19			44	52		79,809	133	25	133		6	297	225	+ 32.0	548,628	38	13	9	51	47	49
Iowa												2			2	3	— 33.3	3,470	1			1	1	
Kansas	77	5	43	2	2	129	109		430,362	743	43	606	23	9	1,424	1,435	— 0.8	4,802,080	251	22	9	273	268	284
Kentucky	48	6	33		4	91	90		155,299	329	94	241	3	13	680	341	+ 99.4	1,244,462	90	20	11	110	99	72
Louisiana	30	8	19		1	58	71		384,155	350	42	229	4	5	630	536	+ 17.5	4,659,919	171	7	10	178	171	112
North La.	9	7	9		1	26	35		100,149	88	36	103	1	2	230	249	— 7.6	989,851	57	2	6	59	55	33
South La.	21	1	10			32	36		284,006	262	6	126	3	3	400	287	+ 39.4	3,670,068	114	5	4	119	116	77
Michigan	26	9	44			79	59		203,071	218	51	300		5	574	494	+ 16.2	1,403,246	93	18	36	111	110	96
Mississippi	11		6			17	27		102,564	83	2	78	1		164	81	+102.5	955,540	42	3	1	45	44	14
Missouri	1	1	2			4	7		2,934	13	6	18			37	22	+ 68.2	33,088	2		3	2	1	3
Montana	14	1	12			27	20		72,407	172	21	80	9		282	178	+ 58.5	718,211	44	12	35	56	60	70
Nebraska	1		1		1	3			9,302	4		5		1	10	36	— 72.2	27,042	1			1	2	3
New Mexico	32		9			41	22		135,067	220	14	98		5	337	227	+ 48.5	1,026,417	92	9	9	101	100	68
New York	73			41		114	108		153,212	664	2	13	377		1,056	1,038	+ 1.7	1,457,435	100	14	25	114	108	122
N. Dakota																					1			
Ohio	38	23	27			88	104		217,885	160	350	298	13	1	822	681	+ 20.7	2,151,354	167	23	41	190	192	191
Oklahoma	109	7	19	6	4	145	138		598,851	854	122	490	45	20	1,531	1,195	+ 28.1	5,432,976	493	32	14	525	456	338
Pennsylvania	126	28	6	113		273	316		511,667	1,194	241	65	1,073	1	2,574	2,101	+ 22.5	4,580,832	278	35	57	313	337	280
S. Dakota																					2			1
Tennessee										2	1	6			9	6	+ 50.0	7,848	1		1	1		4
Texas	307	27	158	5	15	512	485		2,310,295	2,922	172	1,808	19	120	5,041	3,501	+ 44.0	22,717,904	1,168	68	124	1,236	1,200	726
E. Tex. Border		2	2			4	3		29,549	8	6	14			28	16	+ 75.0	174,615	20	1	1	21	10	9
E. Tex. Field				1		1			4,049				1	3	4	5	— 20.0	4,509						
Rest E. Tex.	11	1	6		1	19	25		118,677	112	5	115		2	234	196	+ 19.4	1,410,532	54	4	16	58	61	59
North	51		48	4	7	110	114		302,671	564	8	544	17	34	1,167	871	+ 34.0	3,438,171	136	6	14	142	136	100
West Central	14		19			33	34		82,573	137	7	181	1	15	341	317	+ 7.6	812,283	56	6	41	62	65	50
West	112		24		7	143	115		631,210	1,048	9	222		49	1,328	774	+ 71.6	5,973,805	449	13	35	462	481	265
Panhandle	28	5	4			37	29		116,172	157	26	26		1	210	163	+ 28.8	661,093	147	20	8	167	140	43
Upper Coast	35	7	17			59	56		409,170	263	29	191		10	493	267	+ 84.6	3,532,189	113	5	1	118	118	68
Lower Coast	37	9	17			63	67		419,859	454	61	258		3	776	530	+ 46.4	4,926,934	133	8	2	141	120	88
Southwest	16	3	14			33	35		150,455	153	20	196		2	371	310	+ 19.7	1,493,511	35	4	5	39	49	33
S. Central	3		7			10	7		45,910	26	1	61		1	89	52	+ 70.8	290,262	25	1	1	26	20	11
Utah												1			1			4,743			5			2
West Virginia	9	67	11			87	111		226,894	72	622	107		1	802	569	+ 40.9	2,062,495	108	18	17	126	112	69
Wyoming	12	1	3			16	13		71,593	121	2	19	1	1	144	103	+ 39.8	639,576	57	2	88	59	61	47
Total U. S.	1,213	195	495	168	39	2,110	2,155		6,958,440	10,753	1,850	5,551	1,578	310	20,042	15,718	+ 27.5	66,230,744	3,800	367	570	4,167	4,032	3,168

* Includes distillate wells. [1] Wells completed in 4 weeks, or 28 days, ended Oct. 28, 1944. [2] Wells completed in 5 weeks, or 35 days, ended Oct. 30, 1943. [3] Wells completed in 4 weeks, or 28 days, ended Sept. 30, 1944. [4] Wells completed in 44 weeks, or 308 days, ended Oct. 28, 1944. [5] Wells completed in 44 weeks, or 308 days, ended Oct. 30, 1943. [6] Water input, gas injection, and salt water disposal wells.



Don't Kill Your Well

Keep Flowing Wells Flowing

The producing oil sand is the very heart of your well. Don't gamble all the money invested in the producing oil sand of your well against a few dollars expense for cleaning it out.

The modern, IMPROVED CAVINS method of cleaning your well eliminates the risk of lost or reduced flow . . . makes thorough and effective cleaning an easy, simple job. When flowing wells sand up the tubing, do not run the risk of killing the well in order to pull the tubing. It may never again be as good a producer. The CAVINS provides a special type bailer designed to run inside tubing which eliminates the necessity of either pulling or killing the well.

By running the CAVINS Bailer through a lubricator above the Christmas Tree, high and low pressure wells can be cleaned without killing them, using mud, or pulling the tubing. It is not necessary to remove or make extensive changes on the Christmas Tree. The lubricator is mounted above the master valve, and the Cavins Bailer run in the tubing with adequate safeguards against high pressure.

This method is unsurpassed for cleanout jobs, for breaking out bridged-over tubing, for cleaning chokes and flow valves. It can be run on the sand line or on Halliburton lines. Various size bailers are applicable to any job.

Cavins expert clean-out service is available at all Cavins Service locations, listed below. Call the one nearest you and have a Cavins Service Man do the job better, more economically, and without risking lost or reduced flow by killing the well.

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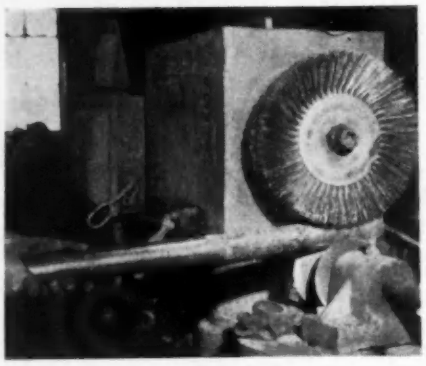


Roller stand and motor-driven brush simplify cleaning of rusted pipe for reclaiming.

Where considerable quantities of old pipe are to be cleaned for inspection and possible reclaiming through spot-welding, use of a motor-driven wire brush and a simple supporting stand speeds the work over other methods of hand cleaning.

MATERIAL RECLAIMING

The stand for supporting the pipe consists of a stub shaft, carried in a base which may be bolted to a table or stand for rigidity, with a deeply grooved pulley running on this shaft and held in place by a removable collar.

The pipe may be fed against the brush by hand if the brush rotation be against the travel of the pipe, or the rate of speed may be controlled by the operator if the motion be away from him. This latter, although tending to make control of short pieces of pipe more difficult, does not shower the operator with dirt as does rotation in the opposite direction.

Angle Iron Support Protects Pump Barrels

Transportation of pump barrels between warehouse and well requires the exercise of considerable care lest the accurately formed unit be damaged and its effectiveness destroyed before it is even installed.

EQUIPMENT TRUCKING

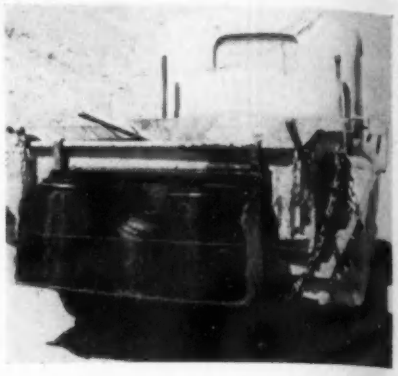
One company solves the problem of pump-barrel transit by welding a 3-inch angle iron along the side of the lease truck, with the open or V-side upward. The trough thus formed is long enough to hold the barrels used on the lease, and sturdy enough to carry a section of pipe if required.

A clamp near the front end of the support provides for fastening the load in place, or the barrel may be secured by wrapping a light line spirally around barrel and trough, passing the end between trough and truck bed on each turn to hold the wraps in place.

Being built along the side of the truck bed, the low trough does not interfere with the transportation of other equipment, and may be used as a stop against which such heavy objects as tool boxes may be chained when smaller diameter objects are being carried in the trough.

Welded along one side of the service truck, this angle-iron support will protect pump barrel from damage on the road, clamp providing hold without need for chaining.

Tail-Gate Can Rack Handles Dirty Containers



Light rack suspended outside truck supports cans without fouling material within truck.

On many leases the lubrication of pumping units, jack lines, jacks etc., requires that considerable quantities of oil be carried around in service trucks. The operator of one lease uses the heavy crude oil produced by his wells for lubrication. The oil cans used must be open top and to avoid spilling on the truck, the operator devised the handy carrying rack shown in the illustration.

LUBRICANT TRANSFER

The rack, made from scrap sheet steel, was just wide enough to accommodate five gallon cans. A heavy wire about mid-way up on the cans prevents their tipping. The entire rack was hung over the tail gate of the pick-up truck and is quickly removed. Besides being a much cleaner way to carry open cans of oil, this rack has the feature of being close to the ground, lessening the amount of lifting done by the pumper.

Auxiliary Truck Tanks Carry Solvent Stocks

Oil field construction crews and roustabout crews have frequent need for gasoline, distillate and lubricating oil. These liquids usually must be carried at all times in order that the oil or solvent be available for lubricating or cleaning when needed. The amount needed usually is not great and is unimportant compared with the fact that the small amount used is urgently needed at that particular moment.

SOLVENT CONTAINERS

One contractor solved the problem of finding space on his trucks for several containers of different kinds of liquids, by making tanks from 6-inch pipe. The length of pipe used varies from 2 to 4 feet and holds from 3 to 6

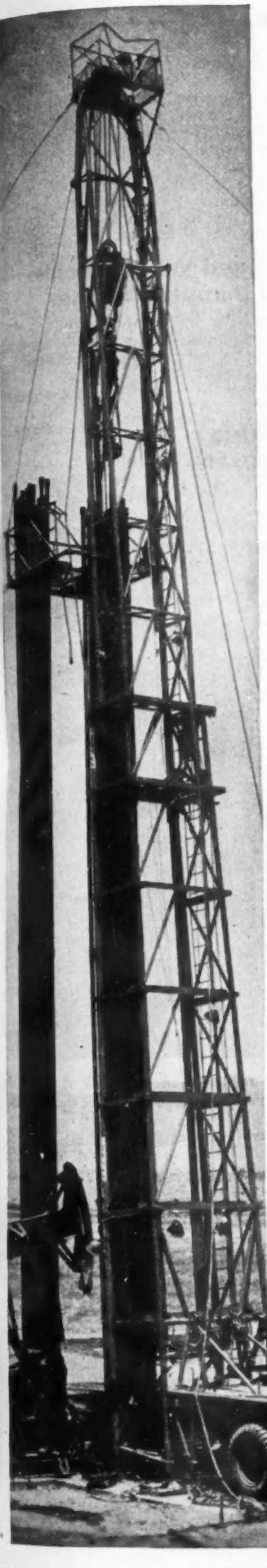
Drill More Wells!

CUT RIG MOVING TIME WITH WALTER TRACTOR TRUCKS

Rig moving time is unproductive time. The faster you move equipment to new locations . . . the sooner drilling can be started . . . the more wells each rig will drill in a year!

Walter Tractor Trucks are especially designed and built for off-the-road hauling. Because of their rugged power and traction, they haul heavy loads fast and unfailingly over mud, sand, ruts, slippery surfaces and grades that stop anything else on wheels. Through the exclusive Walter Four-Point Positive Drive, three automatic locking differentials proportion power to four (or six) driving wheels according to their traction at any instant. No wheel spinning to bog down or stall your equipment!

Walter Tractor Trucks further meet oil field hauling conditions because Suspended Double Reduction Drive provides greater gear capacity, higher ground clearance, less unsprung weight; giant, heavy-duty motor supplies power for both hauling and operation of equipment; cab forward design insures proper weight distribution and maximum equipment space. Take the first step today toward gaining more productive time for your drilling and servicing rigs. Write for detailed engineering literature.



This 250 h.p. Six-Wheel Drive Walter Tractor Truck is equipped with a 90 ft. portable telescoping derrick and servicing unit, operating in California. Exclusive rear bogie design provides parallel wheel motion. Cab forward design and 21 ft. wheelbase provide ample room for equipment, correct weight distribution for derrick in traveling position.

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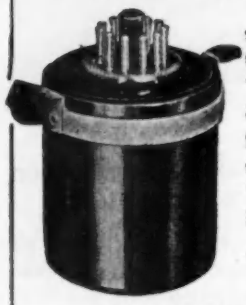

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* Also available with terminal lugs

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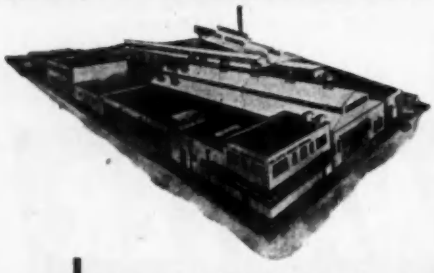
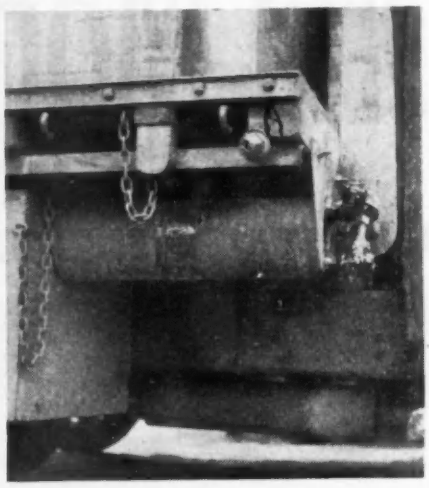


IN OUR NEW PLANT pictured above, all our efforts are devoted to "Forging Ahead" for the American victory.

Specify BRONZOID as your standard bearing bronze

OIL CITY BRASS WORKS
FOUNDERS MANUFACTURERS MACHINISTS



Fitted beneath truck body, these tanks provide quick drawing of solvents without leakage on load.

gallons of liquid. The ends are welded shut and simple inlet and outlet are provided. The tanks are mounted underneath the truck bed with the faucet ends within handy reach of the operators. Because the tanks are below the truck bed, the working space of the truck remains unchanged.

Special Trailer Bed Assists Pipe Handling

TRAILER PIPE RACK

Equipping the pipe trailer bed with raised sides to prevent loss of pipe makes it difficult to haul flat pieces of equipment, tank plates and the like. One production superintendent solves the problem of anchoring pipe for rough lease road hauling by having notches formed in the front and rear members of the trailer bed, making them low enough so as not to interfere with flat loading, but at the same time providing support against which pipe might be chained, tied or clamped with a boomer against shifting.

For hauling short pipe, the notches provide protection for threaded ends which lack collars or metallic covering, by checking the side sway and banging together of pipe which so often results in damaged threads, dented ends or distortion which prevent proper fitting tightness.

The crests between the notches are made flat instead of being carried to a point, to reduce possible damage to flat materials being transported.

Notched cross members on this unit provide separation for pipe, permit easy securing of load.

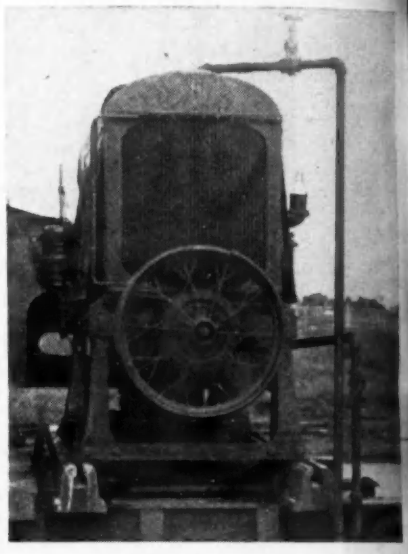
$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

Salvaged Wheel Cranks Field Pumping Engines

CRANKING SAFEGUARD

Backfiring as pumping engines were being cranked has resulted in many pumpers' injuries; while the desire to insure against such accidents has led many operators to retard the spark to the point where imperfect combustion leads to engine fouling and multiplies maintenance chores.

To eliminate the possibility of such cranking accidents one company removed the cranks from its engines, replacing them with old wire wheels salvaged from automobile junk piles. The crank is removed completely and the stub shaft which joins the extended section of the crank to the notched engine shaft end is welded to the spindle carrying the wheel. The unit is equipped with a spring to insure disengagement of the cranking pin once the engine starts, to remove the hazard which the rapidly revolving wire wheel would otherwise present.

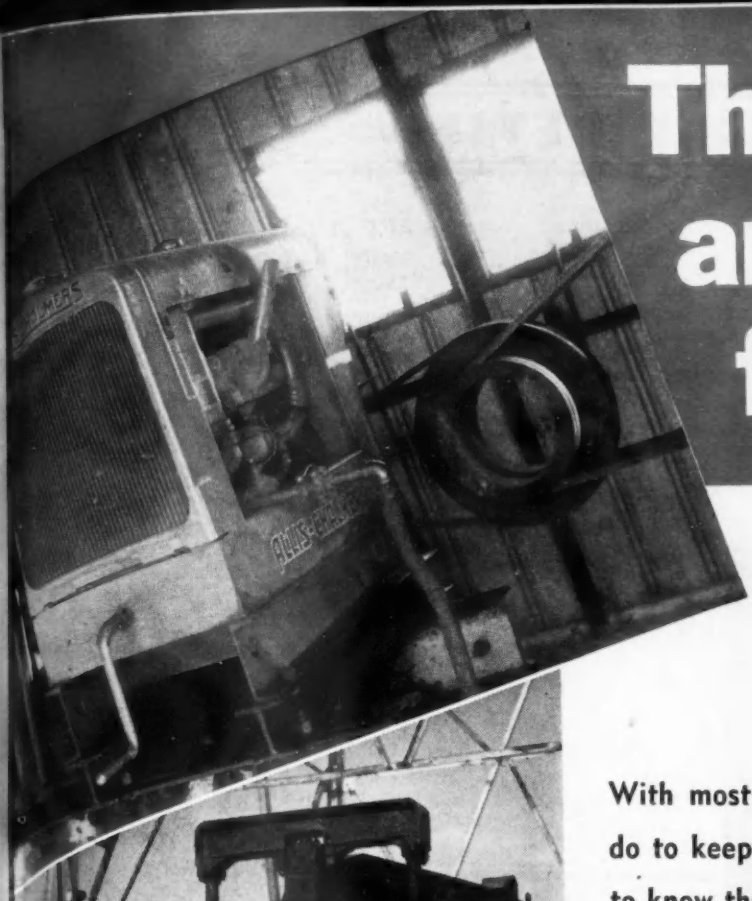


Replacing the usual starting crank, this old wire wheel is spun with rope and injuries thus avoided.

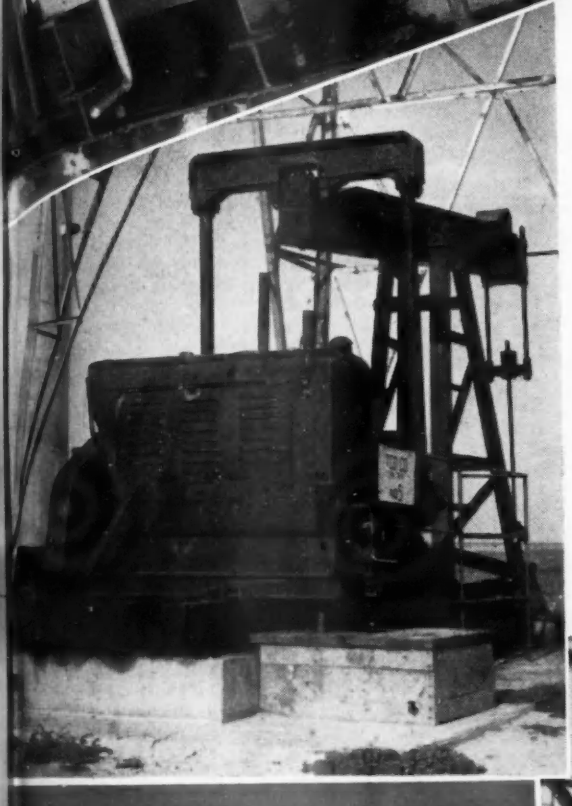
A notch in the outer rim of the wheel takes a knot in the end of the spinning rope, which is then wound in the proper direction around the rim for several complete turns. The engine is started by pulling on the rope much as an outboard motor is started, except that the cranking wheel is vertical instead of horizontal.

In extreme cold weather, when the engine is especially stiff to turn over, pumpers frequently tie the end of the spinning rope to the car bumper, driving off rapidly to give the pumping engine the required spin to enable the ignition to catch and begin the firing cycle.

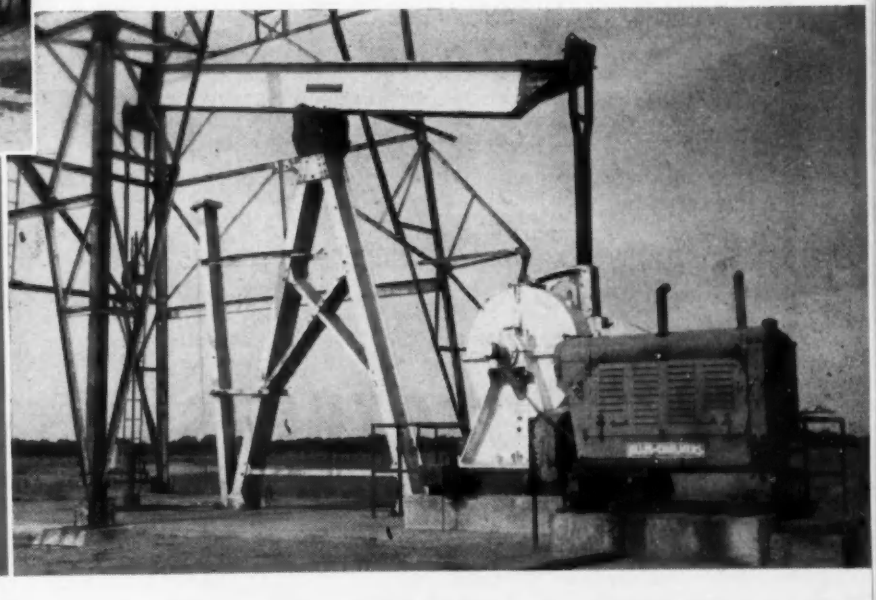
These Wells are READY for Winter



They are equipped with Allis-Chalmers heavy duty, slow speed, high torque pumping engines, designed and built to meet actual field operating conditions, winter or summer alike.



With most operating personnel having all they can do to keep leases going, it's a source of satisfaction to know that your pumping engines will require little attention. ALLIS-CHALMERS ENGINES are built to give that kind of service—continuous operation at maximum torque—positive governor control at all engine speeds—high torque at slow engine r.p.m. because they are not light automotive type. It's necessary to place your orders early!



(Top) ALLIS-CHALMERS Model W Engine, 128 ft., lbs. torque on inside pumping installation.

(Above) ALLIS-CHALMERS Model U Engine, 200 ft., lbs. torque.

(Right) ALLIS-CHALMERS Model E Engine, 400 ft., lbs. torque.

FRED E. Cooper

Hale Station, TULSA, OKLAHOMA

PIPE LINE REVIEW

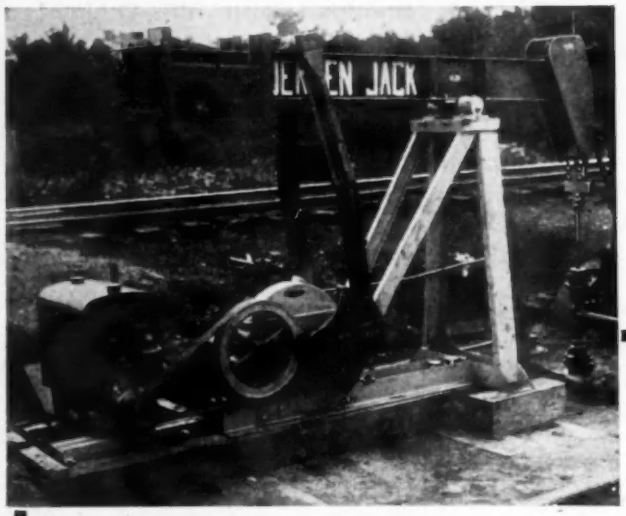
New York Firm Plans Line From West Texas to Coast

Natural gas purchase options are being sought from producers in the keystone and other Winkler County areas by Chester A. Ring, Jr., of New York, president of Metropolitan Natural Gas Company, which proposes to build a transmission line from West Texas to the Los Angeles district.

The proposed 990-mile, 26-inch line would handle a minimum of 200,000,000 feet daily with provisions for an ultimate load of 350,000,000 feet daily. C. V. Lyman, Midland producer, is negotiating option contracts for the firm, which has not made formal application to the Federal Power Commission, or the WPB.

River Crossing Under Way

Anderson Brothers, Houston and Tulsa, are constructing a 12-inch river crossing over the Arkansas River near Sand Springs, Oklahoma, for Texas-Empire Pipeline Company, Tulsa.



Oil Couldn't Cost Less

Oil from any given well costs as little as possible when pumped with a JENSEN Unit. We have worked on that for 25 years.

Many of our customers are unhappy when a well is equipped with anything but a JENSEN. The JENSEN Unit seems to fit, probably because producers themselves have taken such an active interest in its development and perfection. They say that even other equipment, above and below ground, seems to do better and last longer when a JENSEN lifts the oil.

So we welcome investigation. Talk with JENSEN owners. See your JENSEN dealer. Consult our pages in your Composite Catalog and write us for illustrated bulletins.

JENSEN BROTHERS MANUFACTURING CO.

. . . Coffeyville, Kansas, U. S. A. . . .

EXPORT OFFICE: 50 CHURCH STREET, NEW YORK CITY

FPC Allows 65-Mile Link With T-G-T Line in Kentucky

The Federal Power Commission authorized the Louisville Gas and Electric Company, Louisville, to construct 62 miles of 8-inch and three miles of 12-inch pipe line from its Cannons Lane mixing station to a point of interconnection near Calvary, Kentucky, with the Tennessee Gas and Transmission Company's Texas-West Virginia pipe line, and a cross section of 6-inch line, for emergency use only, between its existing 12-inch line and the Tennessee company's 24-inch line where they cross in Menifee County, Kentucky.

The commission will hold a hearing November 14 at Bradford, Pennsylvania, on the application of Hanley & Bird, of that city, for authority to abandon and remove approximately eight miles of 8⅝-inch transmission line running from the Woodhull natural gas field in New York to Elkland, Pennsylvania.

Laying of Haynesville Field Line Nearly Finished

Laying of 110 miles of two to 24-inch line in the Haynesville field of Claiborne Parish, Louisiana and Columbia County, Arkansas, to serve the gasoline extraction and cycling plant is about 90 percent finished.

The remainder is to be completed shortly. Steady progress is being maintained on the plant, which is being constructed by Jones and Laughlin Supply Company. Sharman and Allen, Houston contractors, are laying the gathering system.

57-Mile Pennsylvania Line Laid Ahead of Schedule

Fifty-seven miles of 12¾-inch gas line in northwestern Pennsylvania, including a 1200-foot crossing of the Allegheny River, have been completed 30 days ahead of schedule by Anderson Brothers, Houston and Tulsa.

Pressure welding was used on a 37-mile section through rugged terrain.

Louisiana Pool Gathering System to be Constructed

Sharman & Allen, Houston contractors, will lay a 6 and 8-inch gathering system for the Cotton Valley Operators Committee in the Cotton Valley pool, Webster Parish, Louisiana. The amount of line involved has not been determined.

Gas Line Planned

Glen McCarthy, Houston, has purchased 24.7 miles of 10¾-inch pipe for a gas line from the Winnie area to his line near Beaumont, Texas. Contract to lay the carrier will be awarded this week.

Line Relaid

United Gas Pipe Line Company has reported that the section of 16-inch gas line taken up on the Katy Goodrich line northeast of Houston has been relaid and put back into service. Sharman and Allen, Houston, were the contractors.

Lower Crude Output and Runs to Stills Require Drawing on Stocks of Products

Lowering of both crude production and refinery runs in the week ended November 4 had an unfavorable effect on production and stocks of the major products. Output of both light and heavy grade fuel oils declined, and stocks of these products had to be reduced materially in meeting requirements. Production of gasoline was slightly larger than in the previous week, but there was a substantial draft on stocks. The lower rates of operation permitted, however, some building up of crude stocks.

U. S. crude production of 4,719,000 barrels daily was 21,000 a day lower than in the preceding week, although 330,000 daily or 7.5 percent higher than the output in the corresponding week last year. Crude runs to stills, at 4,570,000 barrels daily, were off 88,000 daily from the week before, although 473,000 daily or 11.5 percent above runs in the comparable week a year ago. Stocks of refinable crude in the nation totaled 223,235,000 barrels on October 28, the Bureau of Mines reported; an increase of 1,524,000 barrels during the week ended on that date; and for the week of November 4 another increase was forecast by the data on production and runs.

Production of gasoline, including natural blended at refineries, averaged 2,022,000 barrels daily, up 5000 from the week before and an increase of 280,000 daily or 16.1 percent over the like week last year. Stocks of finished and unfinished gasoline were reduced at the rate of 93,000 barrels daily, having declined to 78,409,000 barrels, an amount which was, however, 9,735,000 barrels or 14.2 percent above that of 68,674,000 barrels held November 6 last year.

Distillate fuel oil production of 653,000 barrels daily in the week of November 4 was 29,000 daily less than in the previous week but 35,000 a day or 5.8 percent more than output in the like week last year. Stocks were reduced 33,000 barrels daily, to the level of 48,477,000 barrels. That amount was 3,670,000 barrels or 8.2 percent more than the 44,807,000 barrels reported for November 6 last year.

Residual fuel oil production of 1,224,000 barrels daily was 59,000 a day less than in the previous week but 45,000 a day or 3.8 percent more than in the like week last year. Stocks were used at the rate of 134,000 barrels daily and declined to 63,444,000 barrels, practically the same level as on the corresponding date last year, after having been a half million barrels above the year-ago trend at the beginning of the week.

Safety Conference to Be Conducted at Ponca City

The second of a series of district industrial safety conferences at which a number of oil company officials will participate, will be held at Ponca City, Oklahoma, November 16, under the sponsorship of the Oklahoma Industrial Safety Council. Topics to be discussed include: what can a small plant do to control accidents, organization of a small plant safety program, safety committees' functions and organization, improving a safety program, accident forms and records, how to inspect, creating and maintaining interest in safety.

Henry W. Bogess, Sinclair Prairie Oil Company, Tulsa, will preside at a panel session on: "Effective Accident Prevention in Small Plants" and those taking part will include W. A. Murphy, commissioner of labor, Oklahoma City; Dr. J. Walter Hough, Oklahoma state health department; Lowell C. Brown, University of Oklahoma; Don Crall, superintendent, Stanolind Oil & Gas Company; C. R. Sliger, Insurers & Indemnity Insurance Company, Tulsa; Don A. Klemme, Stanolind Oil & Gas Company; Don Eels, Cities Service Oil Company; V. W. Stoker, Sinclair Prairie Oil Company. G. M. Kintz, district engineer, United States Bureau of Mines, Dallas, will present a series of demonstrations and experiments on "Dusts, Fumes and Vapors."

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 3
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	[1]4,762	9-30	[1]4,775	9-30	240,992	1- 1	89,162	4- 1	48,863	10-28	64,644	10- 7
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	[4]220,623	9- 9	76,302	1- 1	30,232	4-29	49,737	3-18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	247,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,453	8,680	59,839
September 30	[1]4,762	[1]4,775	222,393	14,494	78,028	4,622	45,329	9,292	64,226
October 28	4,740	4,658	223,235	14,117	79,058	4,772	48,705	8,985	64,382
November 4, 1944	**4,719**	**4,576**	.....	**14,152**	**78,409**	**4,569**	**48,477**	**8,570**	**63,444**
November 6, 1943	4,389	4,097	[5]237,219	12,193	68,674	4,320	44,807	8,256	63,398
Change:									
In week	—21	—88	+1,524	+35	—649	—203	—228	—415	—938
In year	+330	+473	—13,984	+1,959	+9,735	+249	+3,670	+314	+46
In year	+7.5%	+11.5%	—5.9%	+16.1%	+14.2%	+5.8%	+8.2%	+3.8%	+0.1%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, October 30, 1943.

International Developments

Four Producers Reported In Constancia Field, Peru

The Peruvian State Petroleum Commission reported that four producing wells are in operation in the government-owned Constancia field, a few miles north of the old Lobitos fields.

The discovery well, drilled to 540 feet, was completed last December, producing 70 barrels per day. During the last eight months three more wells have been brought in, with deeper pays, although none is more than 1000 feet deep. The daily average production of the field is approximately 1200 barrels. Several more wells will be drilled during 1945, according to reports. Some of the oil is being run by pipe line to the Villar refinery, the remainder being piped to the seaport terminal at Talara.

Higgins Reported Heading Venezuelan Railroad Group

Andrew J. Higgins, New Orleans industrialist, is reported to be heading a syndicate representing both American and Venezuelan capital, that has obtained approval of plans for a railroad linking Caracas and Maracaibo along a route connecting with Valencia, San Felipe, Barquisimeto, Trujillo and the oil field area on the east side of Lake Maracaibo.

The plan was submitted by Higgins during his recent trip to Venezuela and was well received by Venezuelan government officials.

Shell Planning Line From Casabe Field in Colombia

Colombia has announced that Shell Petroleum Company of Colombia plans a pipe line from its Casabe field in the Magdalena Valley to Cartagena, where a refinery probably will be built to handle the output of the field.

The company plans to begin shipping oil from Casabe within the next three months, utilizing the excess capacity of the Andian pipe line for the time being. If the new line is put in it probably will be connected with the Dificil field, which Shell is developing 115 miles east of Cartagena.

Texas Co. Granted More Concessions in Venezuela

Sociedad Anonima Petrolera Las Mercedes (The Texas Company) has been granted additional concessions in Venezuela totalling 108,000 hectares and covering 13 parcels of land in the states of Aragua and Guarico.

Venezuelan Atlantic Refining Company has applied for concessions on five blocks in Monagas, one covering 10,000 hectares, and the other four of 500 hectares each.

Colombia Wildcat Planned By Texas Petroleum Co.

The Texas Petroleum Company is preparing to drill a wildcat on the east side of the upper Magdalena Valley, Colombia, on company fee property.

A roadway is being put in from Puerto Nino on the river to the site of the proposed well. Property on the opposite side of the river is part of the La Dorada concession of the Richmond Petroleum Company, which also is preparing to drill its first test in the vicinity. The two prospect areas are nearly 200 kilometers up the Magdalena from Barranca Bermeja.

Richmond to Commence Venezuelan Wildcat

Richmond Exploration Company (Standard Oil Company of California) is building roadway and camp facilities for its first well in Venezuela: Montanita 1, located in the district of Miranda, state of Falcon. This well, a deep test, is scheduled to begin within the next two months.

The affiliated Richmond Petroleum Company, operating in Colombia, is reported to be making plans for exploration and development of its La Dorada block, on the west side of the Magdalena River some 300 kilometers southwest of the Infantas, La Cira and Casabe fields. A camp is being constructed and location has been cleared for the first well.

Shell Below 1500 Feet With Ecuador Wildcat

The Shell Company of Ecuador, Ltd., was drilling below 1500 feet at the end of October in its Arajuna 1 wildcat, Napo Pastaza province, Ecuador.

This is the first test to be drilled in the company's large concession block on the east side of the Andes, where detailed geological and geophysical surveys have been progress for two years. Equipment and supplies were transported by plane, truck and pack train, after being carried by boat up the Jambeli River from Guayaquil.

Union Enters Paraguay

Union Oil Company of California, after a year of negotiations, has entered into a formal partnership contract with the government of Paraguay for exploration and development of the petroleum resources of the Gran Chaco region, once claimed by Bolivia. The agreement calls for sharing of costs of exploration, involving long-term geological and geophysical surveys before exploratory drilling is done.

Discovery Denied

Officials of International Petroleum Company branded as "unfortunately untrue" the wide report that its Camarones 1, wildcat on the northern coast of Ecuador, had blow in wild. The well is drilling below 2000 feet, with no saturations logged.

Venezuela Activity

Venezuela had 62 rigs in operation at the end of October, 46 of them in eastern Venezuela and 16 in the Lake Maracaibo area of northwestern Venezuela. Most active operators at present are Creole Petroleum Corporation, Mene Grande Oil Company and Shell.

More Wells Being Drilled Near Dhulian Field, India

Attock Oil Company, Ltd., is reported drilling additional wells in its new field west of the Dhulian field, northwest Punjab, India. The field was discovered in May, 1944, the first well being completed as a flowing producer, yielding heavy, asphaltic oil at the rate of more than 9000 barrels daily, initial flow. The company's refinery at nearby Rawalpindi is being enlarged to handle the heavy crude, which runs high in lubricating oil and grease fractions, badly needed in India.

Burmah Oil Company is understood to have owned the exploration licenses in the area and to have an interest in the oil produced. The government of India has advanced funds for development.

Standard Firms Contribute To Employes' Thrift Plan

Employes of The Carter Oil Company and Oklahoma Pipe Line Company will receive a share of approximately $3,800,000 which the Standard Oil Company (New Jersey) and affiliates are contributing to the Employes Thrift Plan.

Every employe participating will receive a credit of $25. The remainder of the $3,800,000 contribution will be distributed on a proportional basis. Employes in military service will share.

Handicapped Workers Aid

The Division of Occupational Analysis, War Manpower Commission, Washington 25, D. C., has a number of publications on techniques that have been developed for the placement and guidance of physically handicapped workers.

☆

L. F. GRIFFITH will rejoin the staff of the Petroleum Machinery Corporation, New York City, on November 15 as power engineer in connection with the supply of equipment for power projects in the petroleum industry and other power developments in the foreign field. Griffith recently resigned from the WPB as deputy chief, Materials Distribution Section, Power Division of Office of War Utilities.

J. O. (NICK) CARTER, who has been with Hunt Tool Company, Houston, for 6½ years, became Houston district manager for Industrial Supply Company, Inc., November 1. His offices are at 1530 Esperson Building.

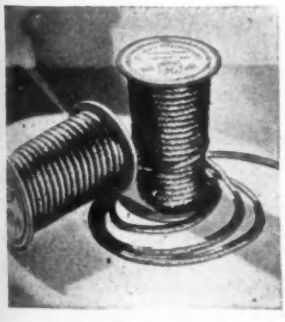
ARTHUR H. CARVER, 74, oil operator, died at Tulsa November 3. A native of Grinnell, Iowa, Carver formed an oil company with his father and brother in 1911, the year he went to Tulsa. Later he joined the Noble Oil Company as vice president, and when the company was dissolved operated independently.

E. R. BUCHANAN heads the land, geological and scouting office opened in Oklahoma City by Midstates Oil Corporation, Tulsa.

"They Sure Hold Up!"

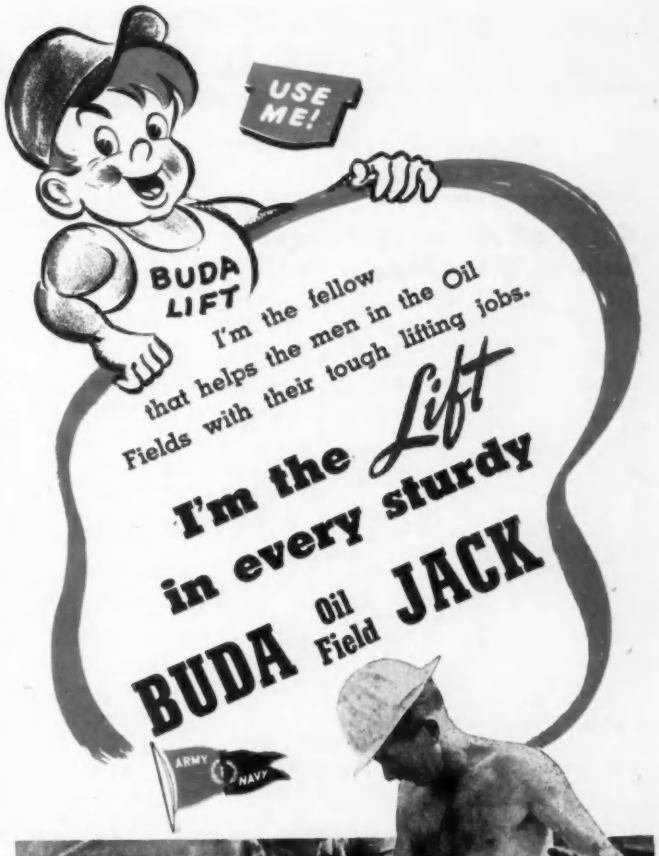
GARLOCK Packings may not last several generations—but they do give much longer service than ordinary packings, because they are produced in our own plant and are *quality-controlled* from raw material to finished product.

The Garlock Packing Company, Palmyra, New York
Tulsa, Okla. Houston, Tex. Los Angeles, Calif.



GARLOCK 117 globe and angle valve stem packing is equally effective against high pressure steam, hot or cold water, or oil. Furnished either braided or twisted in all sizes from 1/16" to 3/4".

Garlock



I'm the fellow that helps the men in the Oil Fields with their tough lifting jobs.

I'm the Lift in every sturdy BUDA Oil Field JACK

Write for Buda Jack Pocket Manual

Sizes and models for all lifting jobs Mechanical and Hydraulic Jacks

BUDA

THE BUDA COMPANY
15436 Commercial Ave. Harvey (Chicago Suburb) Illinois

U. S. Field Operations

Oklahoma

Big Well Hit on Northwest Side of West Moore Pool

J. E. Crosbie, Inc., and Warren Petroleum Company, Tulsa, hit a big well on the northwest side of the West Moore pool in Cleveland County after 2 recent failures in the deep Wilcox had apparently defined the limits of the pool to a small area. Stotts 1, NE SE 30-10n-3w, drilled without much hope of producing after Mid-Continent Petroleum Corporation's Turk 1 and Mullins 2 in the same section failed, was rated at close to 10,000 barrels a day open flow. On drill-stem test at 8692-8720 feet it flowed at the rate of 382 barrels an hour and the flow was so large that it was shut in after two minutes. Well is bottomed at 8712 feet and is higher on structure than other tests in the field with better sand porosity. Oil string was landed at 8720 feet.

West Edmond: Anderson-Prichard Oil Corporation has asked the Oklahoma State Corporation Commission to reduce the pool's daily allowable from 200 barrels to 150 barrels per day as a conservation measure and hearing has been set for November 28. The field has more than 212 producers and leads the state in daily oil runs. Apco's application was based "in the interests of conservation and to eliminate physical waste." Salt water intrusion, especially on the south and west sides of the pool, fluctuating gas-oil ratios and declining bottom hole pressures were given as reasons for cutting allowables.

Interest in possible new trends for the region was indicated when Fox & Fox announced staking of a wildcat in SW NW 6-13n-2w, Oklahoma County, 1½ miles southeast of Edmond on a sizeable block in 31-14n-2w, 36-14n-3w and 1-13n-3w. Both Hunton and Bartlesville zones will be tested. Gulf Oil Corporation gave impetus to the play in central Oklahoma County by paying top prices for 4 tracts at a State School Land Commission sale, acquiring tracts in 16-13n-2w, near Witcher, along the so-called Bartlesville trend paralleling the Nemaha Ridge.

Logan County: Atlantic Oil Refining Company was plugging back to the Layton sand in Kerfoot 1, SE SE NE 31-18n-3w, Wilcox sand discovery, after exhausting the zone which produced about 3300 barrels of oil. The test is immediately south of N. E. Crescent.

Tulsa County: S. M. Evans and associates have given Tulsa County a new oil pool north of Skiatook. Switzer 1, SE NE NW 13-22n-12e, flowed 100 barrels of oil per day natural with 200,000 feet of gas from the Burgess sand. The well, drilled with cable tools, reported a good gas show in the Oswego lime at 820 feet. Burgess was topped at 1515 feet and the well was drilled to 1520 feet, total depth.

Woodard County: United Gas Development Company has assembled a block in Twp 22n-17-18w, and is reported ready to begin 5 wildcat tests in the next 6 months. The area is in the northwest part of the Anadarko Basin feature and the test may be staked between the Mooreland and Curtis communities.

McClain County: The Carter Oil Company's Lamar Ranch 1, C NE SW 28-8n-3w, deep Wilcox play, Anadarko Basin, was drilling below 10,050 feet in Hunton lime topped at 9978 feet. Drill stem test at 10,019 feet with packer set at 9981 feet and tool opened one hour had no shows. Carter's Johnson 1, C SW SE 30-8n-2w, near Noble, was officially completed, flowing 322 barrels of 40-gravity oil and cutting 3½ percent water with 700 pounds tubing pressure.

Grady County: Oklahoma Natural Gas Company's Chandler 1, C NE SE 27-5n-8w, wild gasser in the Chickasha gas pool, was brought under control after burning 21 days. The well ignited while being tested in the Pooler and Charlson zones. An overshot connection was stabbed over the rig floor connections while the well was still burning and after anchoring the gas was killed with mud and the well shut in. When ignited the well was making an estimated 50,000,000 feet a day.

Marshall County: Neff & Godfrey's Jones 1, C NW NW 19-6s-7e, opened a new gas area east of the Aylesworth pool, having been gauged at 19,780,000 feet of gas with a spray of oil. In sand believed to be upper Bromide at 2885 feet, the well gauged 10,000,000 feet of gas. It was drilled to 2911 feet, where the well cleaned itself and operators were to kill the flow and drill to the third Bromide sand zone.

Cleveland County: Gulf Oil Corporatian et al's Price 1, C NE SE 17-9n-3w, deep test along the west flank of the Nemaha Ridge where important strikes have been made in recent months, was drilling below 3244 feet after recementing pipe at 2963 feet. The wildcat is headed for the second Wilcox sand between 9600 and 10,000 feet, but will probably test the Hunton in view of recent developments. It is located on land which formed part of the naval airport in township 9n-3w, and being spotted half way between the West Moore pool to the north and The Carter Oil Company's Washington pool to the south, it is getting considerable attention.

Wells Completed in United States in Week Ended November 11, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	2	34	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	6	5
Arkansas	....	....	....	....	....	....	....	....	1	1	1	3	197	224
California	39	....	....	....	39	....	....	....	2	2	41	75	1,794	1,250
Colorado	....	....	....	....	....	....	....	....	....	....	....	1	26	24
Florida	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	7	4
Illinois	24	....	1	7	32	....	2	....	10	12	44	35	1,707	1,566
Indiana	6	1	....	3	10	....	1	....	2	3	13	7	300	241
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	18	5	1	....	24	1	....	....	3	3	28	25	1,477	1,500
Kentucky	5	....	....	4	9	....	....	....	4	4	13	5	666	360
Louisiana	10	1	....	5	16	....	2	....	4	6	22	16	668	564
North Louisiana	2	1	....	1	4	....	....	....	2	2	6	8	234	263
South Louisiana	8	....	....	4	12	....	2	....	2	4	16	8	434	301
Michigan	7	....	....	3	10	....	....	....	3	3	13	14	598	515
Mississippi	2	....	....	....	2	....	....	....	1	1	3	6	173	84
Missouri	....	....	....	1	1	....	....	....	....	....	1	2	39	24
Montana	....	....	....	....	....	....	....	....	....	....	....	10	292	190
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	11	37
New Mexico	5	....	....	2	7	....	1	....	1	2	9	14	361	233
New York	10	....	15	....	25	....	....	....	....	....	25	25	1,086	1,079
Ohio	4	2	....	4	10	....	....	....	....	....	10	5	755	692
Oklahoma	26	6	1	....	33	2	2	1	9	12	47	33	1,612	1,253
Pennsylvania	29	9	15	1	54	....	....	....	....	....	54	51	2,525	2,199
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	9	6
Texas	72	8	1	14	95	4	3	1	29	33	132	113	5,295	3,669
E.Tex.Bor. Co.'s	....	....	....	....	....	....	....	....	....	....	....	3	31	18
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Rest of E. Texas	1	....	....	2	3	....	....	....	2	2	5	8	250	210
North Texas	10	....	1	3	14	2	1	....	7	8	24	16	1,206	913
W. Central Tex.	6	1	....	4	11	1	1	....	5	6	18	4	363	333
West Texas	30	1	....	3	34	....	1	....	3	4	38	36	1,403	812
Tex. Panhandle	3	6	....	....	9	1	....	....	....	....	10	12	231	171
G. Coast, Upper	4	....	....	....	4	....	....	....	2	2	6	12	510	281
G. Coast, Lower	11	....	....	1	12	....	....	1	4	5	17	18	814	549
Southwest Texas	7	....	....	1	8	....	....	....	4	4	12	5	393	322
S. Central Tex.	....	....	....	....	....	....	....	....	2	2	2	....	91	55
Utah	....	....	....	....	....	....	....	....	....	....	....	....	1	....
West Virginia	3	15	....	2	20	....	....	....	....	....	20	18	819	594
Wyoming	....	....	....	....	....	....	....	....	....	....	....	4	148	107
Total U. S.	260	47	34	46	387	7	11	2	69	82	476	465	20,611	16,430

* Includes distillate wells. † Includes salt water disposal wells.

Kansas

Graham County Test Makes Strike of Much Importance

A strike of major importance was made in Graham County as Skelly Oil Company completed Davis 1, NWc 15-7s-22w, with a physical potential of 518

barrels of oil daily from the Lansing lime. The discovery is 12 miles northwest of the Morel pool in an area where there is little sub-surface control. Arbuckle was topped at 3841 feet and the well drilled to 3854 feet, total depth. After drilling cement and acidizing with 1600 gallons, the well pumped 20 barrels of oil and 175 barrels of water. Plugged back to Lansing topped at 3522 feet and perforated with 41 shots at 3518-24 feet, the hole filled with 600 feet of oil and pumped 85 barrels of oil in 24 hours. Acidized with 1000 gallons it pumped 180 barrels of oil in 10 hours.

Stanton County: Stanolind Oil & Gas Company continues testing Col-Mac 1, center of 32-30s-39w. After coring solid from 2363 to 2614 feet and testing various zones separately, all of which showed gas, the operators acidized all zones with 4000 gallons and recovered 1,800,000 feet of gas at 110 pounds pressure. Shut in for 8 hours, pressure built up to 320 pounds. The wildcat is 6 miles west of the Hugoton gas pool.

Barber County: Two miles southwest of the Coats pool, Lion Oil Refining Company's Allen 1, NW NE NE 2-30s-14w, a wildcat, recovered 90 feet of oil-cut mud on 15-minute drill stem test from 4091-4140 feet in Lansing lime, topped at 3949 feet. Drilling continues below 4200 feet.

Sherman County: Sinclair Prairie Oil Company staked an interesting wildcat 12 miles southeast of the Goodland gas pool, only area with production in the county. The wildcat is Cogswell 1, SWc 20-10s-38w. Sinclair Prairie shot the area in 1942.

Ellis County: The Texas Company's Elmore 1, SE SE SW 35-15s-20w, wildcat southwest of the Penny-Wann pool, was preparing to test an oil show in the Lansing at 3485-3500 feet, after recovering salt water in a test at 3481-94 feet. Lansing was topped at 3485 feet, Granite Wash at 3814 feet, and Granite at 3840 feet.

McPherson County: P. G. Reynolds et al's Goering 1, NW SE NW 27-21s-2w, wildcat east of Moundridge, was abandoned at 3527 feet. F. S. Williams' Morine 1, NW NE NW 30-17s-1w, outpost near Roxbury, is going on the beam after a 1200-foot oil fill up in Mississippi chat, topped at 2707 feet.

Brown County: First commercial production for the county appears certain as Glifton Gall et al were running tubing and preparing to acidize Livengood 1, NE NW SW 3-1n-15e, wildcat about 6 miles southwest of the Falls City area. The well had a 300-foot oil fill up in Hunton lime at 2590 feet. Mississippi lime was topped at 2216 feet and Hunton at 2569 feet. The test is about 6 miles northeast of an Ohio Oil Company dry hole in Nemaha County and the outcome will influence the drilling of another test on the Ohio block of 3200 acres.

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DON J. WALLACE, 60, safety engineer for Sinclair Prairie Oil Company, died at Tulsa November 5. A former safety director with Humble Oil & Refining Company, Houston, he was associated with Mid-Continent Petroleum Corporation in Tulsa before joining Sinclair in 1934.

GOULD RANDOLPH, chief civil engineer with Skelly Oil Company, has been transferred to Eldorado, Kansas, as chief engineer of the pipe line division.

New Mexico

Lea Test Causes Revision Of Outlook for Ordovician

Continental Oil Company et al's Skaggs 2-B-23, between the Monument and Skaggs fields, failed to encounter Ellenburger in drilling 35 feet of hard granite to 10,465 feet, thus causing a revision in the outlook for Ordovician production in this sector of Lea County.

Pipe has been cemented on bottom to perforate opposite oil saturation in basal Permian at 7695-7825 feet. The Montoya was entered at 9395 feet and Simpson at 9775 feet with elevation of 3540 feet, being more than 1100 feet low to Lea County's nearest deep test 28 miles south by east. The latter logged 445 feet of barren Ellenburger before entering granite at 9555 feet.

Humble Oil & Refining Company's Keinath-Federal 1, near the east border of Lea County and an Ellenburger project, was drilling dry lime at 9075 feet.

Tonto Pool: The Texas Company's Baskin 2, north offset to its discovery, was abandoned in water at 3593 feet. A south offset to the flowing well was recently abandoned, while the Dalport Oil Corporation's Cole 1, southeast offset to the producer, was awaiting orders in water at 3653 feet, having indicated a possible small pumper from Yates zone at 3580-83 feet. The Texas Company's Bob. 1, 2 miles northwest, was drilling at 3995 feet to try for a deeper zone.

West Texas

New Production Trend for West Texas Is in Making

A new production trend for West Texas is in the making along a comparatively narrow belt that extends east-west and on top of the deep-seated granite ridge cutting across the Permian Basin.

Seaboard Oil Company and Stanolind Oil & Gas Company's Cravens 1, 11½ miles north by west of the dormant Nairn, or Lubbock 1-well pool, emphasized the trend possibility in showing fair to good oil saturation and porosity in cores at 6066-98 feet. Drill-stem test at 6050-6116 feet returned 2 feet of free oil, 60 feet of heavily oil-cut mud and 160 feet of rotary fluid. It will be deepened to 8000 feet, or granite in accordance with contract made when Seaboard Oil Company sold Stanolind Oil & Gas Company one-half interest in the 160-acre drilling site and another 160-acre lease for $25,000 dry hole letter while the test was bottomed at 5451 feet.

Humble Oil & Refining Company's Jackson 1, first producer for Lamb County and 14 miles west by north of the Cravens prospect, swabbed 5 to 6 barrels of oil hourly then slopped over after using 5000 gallons of acid in broken pay between 5352 and 6006 feet. The latter involve the casing point and plugged back depth, respectively.

Wildcats Showing: Leland Fikes and John Murchison's Alexander 1, Terry County, showed favorable saturation in 2 feet of cores pulled at 5108-27 feet, then landed pipe at 5088 feet to deepen with cable tools.

In Pecos County, Magnolia Petroleum Company's Hart-State 1, 2 miles southwest of the Abell multi-pay field, and about 220 feet lower structurally than the nearest well, was drilling shale at 6155 feet in Waddell, or Basal Simpson, topped at 6073 feet.

Crockett County: Continental Oil Company et al's Todd 11, ¼-mile east extension for the Todd deep area, flowed natural potential of 2028 barrels of 41-gravity oil with gas-oil ratio of 400/1 from Crinoidal perforations at 5815-5915 feet. This outpost confirmed production from the Ellenburger.

Crane County: The Texas Company's Hobbs 3-B, 1⅜ miles northwest of the Crossett pool and a failure in the area's Devonian oil zone, was idle for repairs at 5920 feet in Simpson, topped at 5390 feet, or 428 feet high to the discovery. The same company's Hobbs 2-B, ¼-mile northwest of production, swabbed 22 barrels on 24-hour test after a 280-quart nitro shot in Devonian at 5331-57 feet.

Winkler County: Sun Oil Company's Wheeler 1, southwest edge of the Wheeler-Ellenburger field, gave additional proof of the Devonian becoming an important source of production in the field when drill-stem test at 8524-8610 feet returned 2790 feet of oil and gas-cut mud and 400 feet of free oil. The well began flowing steadily then was killed to deepen to the Ellenburger. The Texas Company's Hogg 1, 1¼ miles northwest of the North Monahans 6200-foot Clear Fork pool, drilled plugs from 7-inch casing at 6250 feet and tested dry after deepening to 6287 feet. Perforations have been made opposite Clear Fork saturation at 6210-40 feet, and acid treatment will follow.

Ector County: Shell Oil Company and Cities Service Oil Company's T.P. Land Trust 1, 4 miles northeast of the Wheeler-Ellenburger field, was drilling limey-shale at 9850 feet, with 3 or more commercial oil zones passed up in the Lower Permian, Devonian and Silurian. The Texas Company's T.P. Land Trust 1-B, 4 miles southeast of the pending strike, logged a nominal show of oil at 6225-70 feet in the Clear Fork, and was drilling dry lime at 6510 feet.

Line from Cap Rock Field In New Mexico Planned

Valley Refining Company, owner of a refinery at Roswell, New Mexico, has purchased materials for the construction of a 31-mile, 4-inch crude line from the Cap Rock six-well field, northwestern Lea County, to its Dexter Station, NE SW 8-12s-27e, Chaves County, on a line that supplies the plant with oil from the Square Lake field.

The Cap Rock area is dependent upon tank trucks for an outlet.

System Expanded

Continental Pipe Line Company is expanding its southwestern Clay County system, North Texas, to provide an outlet for the Scaling 2-well area in laying a 4-mile, 4-inch lateral.

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ANDREW BROWNLOW SLIMP, 82, independent oil operator, and founder of the Pioneer Oil & Refining Company, died in San Antonio, November 2. He was prominent in the development of several Southwest Texas fields.

North Texas

Jack County Test Showing For Commercial Oil Well

Continental Oil Company's Risch 1, southeastern Jack County wildcat that previously tested for 8,000,000 feet of gas with a spray of oil from 4900-foot Marble Falls perforations, is showing for a commercial oil well from Bend conglomerate perforations at 4380-4420 feet. The well swabbed and headed 110 barrels of oil and 14 barrels of rotary fluid on 18-hour test, and swabbed 89 barrels oil and 10 barrels of mud on last test. Acid treatment will follow the removal of the rotary fluid, and a steady oil flow is anticipated. Risch 1 is 4-1/3 miles east of production and within the so-called Fort Worth basin.

Cooke County: Phillips Petroleum Company's Inglish-Eppie 1, wildcat 4 miles south of the Dangle field that flowed briefly from 2400-foot conglomerate before developing water trouble, has been abandoned. Rig will be skidded to a southeast offset location. In the meantime, Al G. Hill et al have scheduled a test for the area.

Clay County: Fain & McGaha's Ross 1, nearly a mile southwest extension for the Ross multi-pay field, flowed 137 barrels of 42-gravity oil with gas-oil ratio of 750/1 on 4-hour gauge for completion through ½-inch choke from bend conglomerate perforations at 5395-5435 feet. This outpost previously swabbed 75 barrels daily after using acid in broken Ellenburger saturation at 5648-64 feet, then plugged back to 5640 feet. Bridwell Oil Company's Ewers 1, wildcat near the west border of Clay County, was drilling 5410 feet, having failed to make a producer in using acid in bend at 5369-88 feet.

Early Completion Slated For 21½-Mile Texas Line

Completion is scheduled within 30 days of 15 miles of 8-inch main line and 6½ miles of 4- and 6-inch gathering lines being laid by Anderson Brothers, Houston and Tulsa, for Lone Star Gas Company, Dallas, in the vicinity of Buffalo and Crockett, Texas. An 8-inch river crossing of the Trinity River is included.

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60,000 ft. 6⅝" (6" line pipe) Threaded and collard, 19 lb., Range I, strictly No. 1 pipe.
25,000 ft. 5" O.D., 18 lb., Range I, threaded and coupled casing, strictly No. 1.
125,000 ft. 2", 3.68 lb., Range I line, No. 1.
20,000 ft. 2½", 6.16 lb., Range I line pipe.
15,000 ft. 1", T & C Range I line pipe.
200,000 ft. ⅝", Pin & Pin sucker rods.
25,000 ft. 4½", Range II, plain end drill pipe for line pipe.
30,000 ft. 4½", 10.79 lb., T & C Range I line pipe.

NEW PIPE

7,500 ft. NEW, 7", 26 lb., Range II J.SS seamless, No Priority, 10% off new.
14,000 ft. NEW, 2½", Eue Range II, 6.20 lb., seamless, No priority, 10% off new.

TUBING

15,000 ft. 2", Eue Range II, 4.70 lb., seamless tubing, No. 1.
10,000 ft. 2⅞", 6.20 lb., Range II, used tubing.

SHOT HOLE PIPE

4,000 ft. 3", O.D., threaded and coupled boiler flues, ready for delivery.

DRILL PIPE

4,000 ft. 4½", Hughes full hole, 16.60 lb., Range II, excellent condition—all tool joints measure 5½" and over.
5,500 ft. 3½", full hole Hughes streamlined, Range II drill pipe, like new.
3,000 ft. 3½", Hughes-Acme Reg. Range II, 13.30 lb., like new.
8,000 ft. 2⅞", 10 lb., Range I, Hughes-Acme, excellent condition.
2,500 ft. 2⅜", Range I, National A.P.I. with tool joints, like new.
1,000 ft. 3½", Range I, Reg. 13.30 lb., tool joints on every joint.

DRAW-WORKS

1—Ideal Type 34-26, with 36" roller bearing Parkersburg Hydromatic brake, jackshaft, all shafts roller bearing, 7⅛" shafts, complete with chains, cathead and all other accessories—excellent condition.
1—8½" Jackshaft, Lucey, complete with roller bearing, Manufacturers Model, excellent condition, complete with cathead and all accessories, Parkersburg Hydromatic brake 36".
4—Parkersburg 36" Hydromatic Brakes, excellent condition.

BLOW-OUT PREVENTERS

1—Cameron 9⅝" S.D.A. 3000 lb. test, 3½" and 4½" rams, excellent condition—with 9⅝" master valve fluid operated.
1—13⅜" Shaffer preventer, with 4½" rams or blank rams.
1—13⅜" Cameron, 3000 lb. test, manual operated, 4½" rams.
2—10", 3000 lb. test, Cameron preventers, A-1 condition.
1—9⅝" Shaffer Head, 3000 lb. test, with blank rams, flanged.
2—7" Cameron fluid operated tubing preventers, 2" and 2½" rams.
1—7" Reagan tubing preventer, new, with hydraulic pump.

DIRECT DRIVE ROTARY UNIT

1—27½" Oilbath Oilwell Rotary, unitized with 9 x 10 Oilwell Vertical engine on steel skids. Excellent condition.

STEAM ENGINES

2—Oilwell 12 x 12 Vertical steam drilling engines. Can be used for direct drive on rotaries.
1—12 x 12 Oilwell steam drilling engine, piston type—complete with all accessories on steel skids.
2—12 x 12 Ideal-Ajax steam drilling engines, piston type—complete with throttle valves, skids and all connections.
4—11 x 11 Gumbo-Buster semi-enclosed drilling engines on steel skids—Ideal for coring units.

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6—Emsco 300 ton, completely overhauled, type C late model.
1—Ideal 300 ton, Model M—completely overhauled.
3—Emsco 150 ton, Model B—completely overhauled.
3—Ideal 100 ton, Model GS, completely overhauled.
2—Oilwell 4", completely overhauled.

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35—6⅝" Reg. A.P.I.—excellent condition.

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East Texas

High-Gravity Oil Strike Scored in Hopkins County

Southern Hopkins County scored a high-gravity oil strike when Humble Oil & Refining Company's Nichols 1, Isaac Friddle Survey, Pickton area and 4 miles northeast of the Coke 6300-foot Paluxy field, flowed 141 barrels of 48-gravity oil, gas-oil ratio 1036/1, natural on 6-hour test through ¼-inch tubing choke. Production was cut back to ⅛-inch choke for flow of 55 barrels oil, gas-oil ratio of 1201/1, on 9-hour test, with 1710 pounds working pressure on tubing and 1860 pounds closed in pressure on casing.

This discovery is producing from Bacon lime, top of second Glen Rose, perforations at 7888-96 feet after plugging back from water in Travis Peak at 8850 feet.

Shelby County Test Makes Slight Showing of Gas

Humble Oil & Refining Company's Pickering Lumber Company 1, S. Francois Survey A-207, Shelby County, is bottomed at 3475 feet and is waiting on cement. A core from 3279-99 feet obtained full recovery of shale and lime with slight showing of gas in streaks of lime.

Rogers Lacy staked location for C. A. Hayden 1, D. T. F. Yordt Survey A-830, projected to 7000 feet.

Southport Petroleum Company is drilling below 3000 fet in R. C. Poore 1, Holmes Byfield Survey, 4 miles northwest of Timpson townsite. This wildcat is south of the Mount Enterprise fault and is not a test to define the Carthage field.

Harrison County: Continental Oil Company and Stanolind Oil & Gas Company were fishing for tools at 4900 feet in shale and lime of the upper Glenrose section in J. S. Harris 1, T. Gray Survey, Trinity Series wildcat 3 miles southeast of Woodlawn. The well is reported running 180 and 190 feet lower than Blomgren-Ogburn's Taylor 1, Payne Survey, 4 miles northeast, which was abandoned several years ago after testing a showing of gas with salt water.

Gregg-Tex Gasoline Company et al have spudded T. B. Page 1, H. R. White Survey, wildcat 4 miles northwest of Hallsville.

Angelina County: Humble Oil & Refining Company, after a fishing job for stuck drill pipe at 2958 feet in Angelina Lumber Company 1, W. H. Herring

Survey, 10 miles west and north of Lufkin, drilled to 4447 feet and is now waiting on cement after setting 9⅝-inch casing.

Bowie County: Barnsdall Oil Company and Sohio Petroleum Company abandoned Gifford Hill 1, M. H. Janes Survey, 1000 feet west of the discovery of Smackover lime production in Eylau field. The well missed the Smackover.

Southwest Texas

Location Made for Another Wildcat in Goliad County

Amerada Petroleum Corporation has made location for a new wildcat 12 miles west of Goliad in Goliad County. Its Ada McFadden 2 will be in the Pedro Trevino Survey, 4760 feet southwest of the company's McFadden 1, which is now testing. The No. 1 well flowed 36.7-gravity oil and some water from perforations at 8932-42 feet, but has squeezed off these perforations and will make another test after perforating for squeeze jobs at 8503-12 feet and 8474-83 feet. The test is to be made between these points.

Amerada is still testing its Waitschies 1, E. J. Armstrong Survey in this general area, recovering considerable oil while swabbing from perforations at 5920-34 feet, but the well had not started flowing at latest report.

Barnsdall Oil Company's Alvin Metz et al 1, 10 miles northwest of Goliad, tested some salt water through perforations at 7951-60 feet, has made a squeeze job, and is making a new test after shooting at 7951-56 feet in the same sand.

Bee County: Magnolia Petroleum Company's W. E. Erp 1, which opened a new producing area 9 miles west of Pettus, has gauged 80.4 barrels of 35.3-gravity oil and 27 barrels of salt water daily through a 7/64-inch choke with tubing pressure 700 pounds. Casing was perforated at 7974-78 feet. The well had reported a number of showings at various depths, but all were thin sand sections with water in bottom.

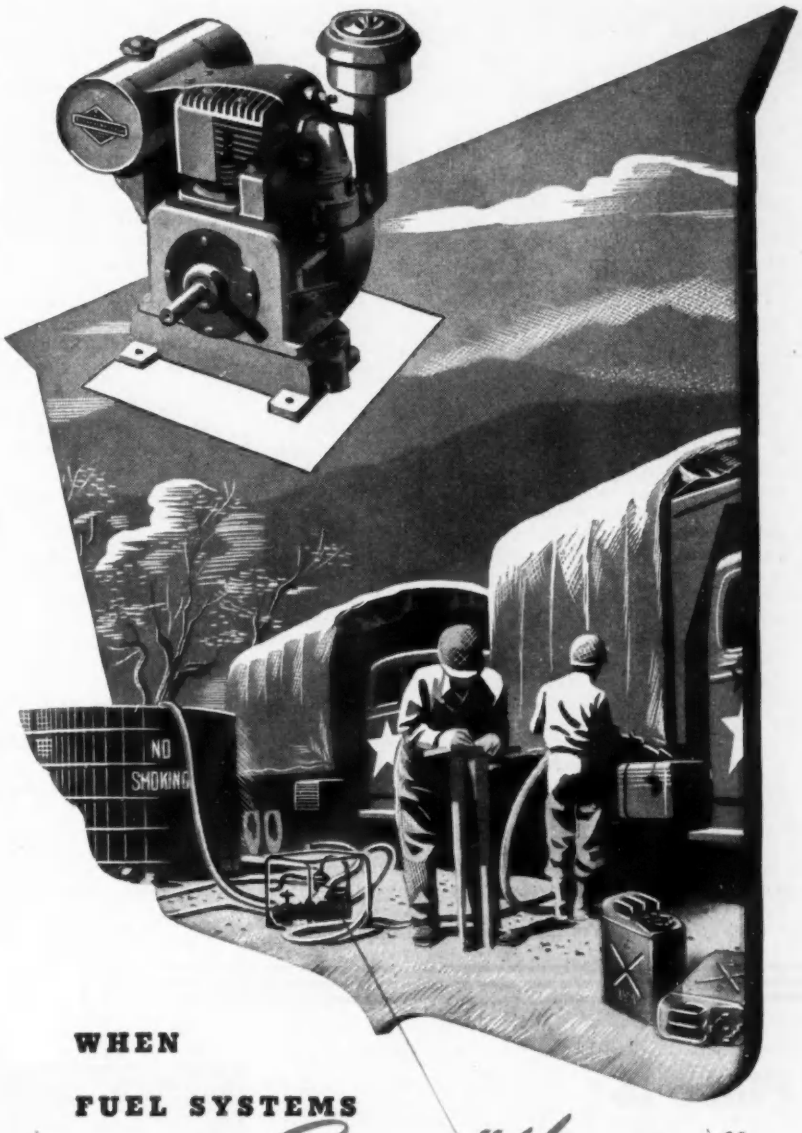
Jim Hogg County: F. B. Lefevre's A. Martinez 1, 12 miles southeast of Hebbronville, has set casing after recovering oil on a drill stem test at 1767-73 feet, total depth. On a 45-minute test with ¼-inch chokes at top and bottom, it recovered 804 feet of oil, mud, and some sand, and has set casing for a production test. It showed very little pressure, and may have to be pumped. Location is in Block 91 of a subdivision of Share 2, Las Animas Grant.

Nueces County: Stanolind Oil & Gas Company is preparing to test its Thompson 4, outpost to the East Riverside field which has set casing at 6559 feet in sandy shale. Several sands had been reported which showed some gas and condensate on drill stem tests before setting pipe.

Texas Gulf Coast

Colorado County Wilcox Test Attracts Interest

Tide Water Associated Oil Company's D. L. Underwood 1, wildcat 3½ miles northwest of Sheridan in western Colorado County, is preparing for another test after having squeezed off all



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perforations, but has attracted considerable interest by showing 29-gravity oil on a test of the Wilcox sand. This test is in a trend where the Wilcox has produced mostly gas and condensate.

The Tide Water well made its first test with casing perforated at 9500-02 feet, and during a drill stem test flowed at the rate of 144 barrels of fluid daily, 89 percent 57-gravity condensate and 11 percent wash water, along with 1,620,000 cubic feet of gas daily. Casing was then perforated at 9530-32 feet and another test made, using ¼-inch chokes and a 2000-foot water cushion. Packer failed in 45 minutes, and recovery consisted of 4800 feet of oil and water, 2000 feet of fresh water, and 600 feet of mud. Packer was re-run and another test made which recovered 184 feet of clean oil, 1564 feet of oil and water cushion, 460 feet of water cushion, and 4232 feet of salt water with 184 feet of mud. Important to the operators is that the oil was 29-gravity green oil with a brownish tint. Total depth is 9990 feet with 7-inch casing at 9962 feet.

Liberty County: Gulf Oil Corporation has tested salt water from the deep sand in its Kirby Lumber Company C-22, Cleveland field, and was preparing to perforate at 9050 feet for another test. The deep perforations were made at 12,485-515 feet and recovery was all salt water with no oil. An interesting feature was the high temperatures encountered at the bottom of the hole. Testing had been delayed considerably because the temperature of 311° F. was sufficient to cause the charges in the gun-perforator to go off prematurely. After failure to reduce bottom-hole temperature by circulating with ice water, using 20,000 pounds of ice, a test was made by lowering the perforator in the hole loaded with blanks. It reached bottom in 14 minutes, and the charges exploded themselves in another 9 minutes. With data gained by this test operators were enabled to run the gun and fire the shots in time for the perforation to be successful and controlled.

Hardin County: Houston Oil Company and American Republics Corporation's Hardin County School Lands Fee 1, has been tested for gas volume, reporting an open-flow potential of 46,000,000 cubic feet daily, showing pressures of 2050 pounds on tubing and 2200 pounds on casing while flowing through a 9/64-inch choke, no gauge being made of the amount of condensate produced. Total depth is 7006 feet with production through perforations at 5796-5807 feet in the upper Cockfield sand.

Matagorda County: Skelly Oil Company's Granbury-Fullilove 1, wildcat which may open a new producing area northeast of Van Vleck, has made new perforations following 3 previous tests, and is preparing to make another production test. On the first test, with casing perforated at 8760-64 feet, it flowed gas and oil through a 5/64-inch choke, making 2 barrels of 34.4-gravity oil in 8 hours. Gas-oil ratio was too high and it was perforated at 8767-69 feet for another test which showed gas, oil and water. Another test at 8769-71 feet showed oil and water and it is now preparing to test higher after squeezing off all perforations. Drilled to 10,010 feet, the 7-inch casing was landed at 8862 feet.

A. H. and C. L. Rowan have made location for a 9500-foot wildcat test, Louis LeTulle 1, 2½ miles west of Markham in the Richard Graves Survey.

Jefferson County: Glenn H. McCarthy's Burrell 1, east extension to the Fannett field, flowed 433 barrels of 33.8-gravity oil daily through an 11/64-inch choke on potential test. Production is from sand topped at 7285 feet.

Washington County: Magnolia Petroleum Company's Herman Lauter 1, Clay Creek field, is still testing after installing pump, but latest test shows it pumping 10 barrels of oil and 2 barrels of salt water in 8 hours. Production is from perforations at 4606-11 feet, a new sand for the field.

Tyler County: American Republics Corporation and Houston Oil Company's Rice 1, wildcat 6 miles southwest of Spurger in the eastern part of the county, is waiting on cement after running 5½-inch casing to 5307 feet for tests of sand in the Cockfield formation. The well was drilled to 8295 feet to explore the Wilcox but apparently failed to show anything and is testing shallower showings around 5000 feet.

South Louisiana

Gas-Condensate Field Near Lake Charles Is Opened

Continental Oil Company has opened a gas-condensate field 9 miles southeast of Lake Charles in Calcasieu Parish, and 5 miles east of the new East Moss Lake field opened several months ago by the same operators. The discovery well, Glen Greathouse et al 1, in 9-11s-8w, is producing from perforations at 10,018-26 feet, making 130 barrels of 52.9-gravity condensate daily along with

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1,639,000 cubic feet of gas, flowing through an 11/64-inch choke with tubing pressure 3300 pounds. The perforations were made opposite this sand after having failed to produce on several tests at 10,900 feet, near bottom of the hole. Fluid is free of water and the well has been shut in waiting for the official potential test.

In the Perkins area, North American Consolidated Oil Company and E. R. Brann's Edgewood Land & Logging Company 1 is testing through perforations at 5370-77 feet with no results available. Total depth is 5418 feet with casing set on bottom.

Vermilion Parish: The Pure Oil Company has opened production in a new area on the southeast flank of the West Gueydan dome by completing its Ferguson-Benoit Unit 1 through perforations at 9619-23 feet, making 213 barrels of 37-gravity oil daily through a ⅛-inch choke. Tubing pressure is 1500 pounds and production includes 120,000 cubic feet of gas daily. Located in the southwest quarter of 5-12s-2w, it is ¼ mile southeast of Magnolia Petroleum Company's Hartwell 1, drilling below 10,250 feet in shale, and is in the same section with Magnolia's Reese D-1, which drilled to 12,208 feet and has been testing at 10,430-445 feet. At that point it had made 200 barrels daily through a ⅛-inch choke but started making half water and had to cement off perforations.

Iberville Parish: Humble Oil & Refining Company's C. G. Robinson 1, Laurel Ridge area, tested at 10,658,660 feet, where it flowed under tubing pressure of 1600 pounds but made 70 percent oil and 30 percent salt water. It has made another squeeze job, top of cement now being at 10,599 feet.

LaFourche Parish: The California Company has made location for a wildcat in the Cut Off area, its Delta Farms 1, which will be in 60-17s-21e, and will drill to 12,000 feet.

Iberia Parish: Humble Oil & Refining Company's Petit Anse Company B-2, on the Avery Island dome, has made a test which practically assures production in a new sand for the area, but has made a squeeze job to recomplete after gas-oil ratios started going up too high. Completion was through perforations at 9515-18 feet where it was flowing 35.5-gravity oil at the rate of 194 barrels in 24 hours through a 10/64-inch choke with tubing pressure 2510 pounds and gas-oil ratio 5263-1. When first brought in it flowed 216 barrels of oil daily with ratio 4665 to 1, and operators decided to make the squeeze job when ratios started going up. No water was reported with the oil and gas.

North Louisiana

Bossier Parish Discovery Due for Additional Tests

Latest test of Barnsdall Oil Company-Sohio Petroleum Company's discovery, J. T. Hanks 1, NW SE 7-20n-12w, Bossier Parish, made after installing heaters on flow lines which had frozen on previous tests due to high pressure of gas, recorded a flow of 164 barrels of 61.6-gravity distillate through ¼-inch choke on tubing. Casing pressure was 2875 pounds and tubing pressure 2850 pounds during the test. Production is through 234 perforations opposite Cotton Valley "D" sand from

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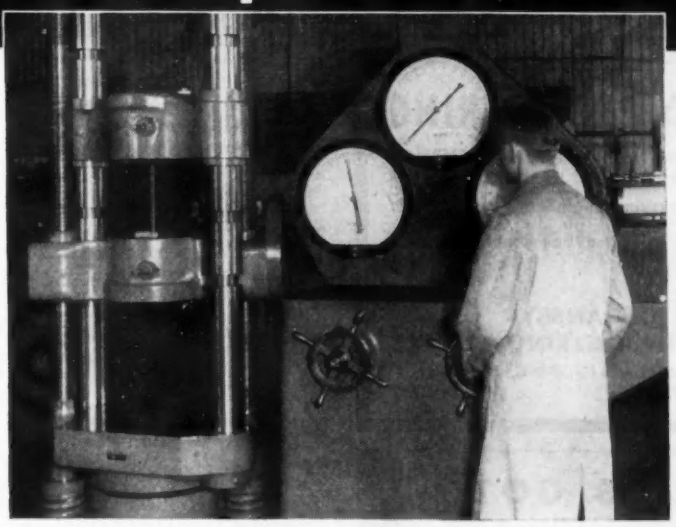

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8001-40 feet. Further tests will be made before official potential is taken. The new field has been named Benton, since it is 6 miles northeast of the townsite.

H. H. Temple will begin operations at Pirkle 1, 31-19n-12w, scheduled 3000-foot wildcat about 6 miles due south of Benton townsite.

Red River Parish: The Texas Company is drilling at 7001 feet in the Pettit zone at Semp Russ 1, 16-12n-10w, recovering lime with good porosity and possibility of producing gas in a core from 6333-48 feet. No drill stem test was ordered and the test probably will go to 7100 feet before running electrical survey.

Lincoln Parish: The California Company will install heavier connections and larger separator before resuming testing of Jessie Mae Norris 1, C NW NE 15-18n-1w, new gas-distillate discovery in the Tremont area. The well flowed 97 barrels of 55-gravity distillate and 2,235,000 feet of gas through ⅛-inch choke on tubing. Production is coming through 120 perforations opposite an unidentified sand from 9060-80 feet.

Big West Drilling Company cemented 10-inch casing at 4017 feet in N. B. Gill Estate 1, C NW SE 35-20n-2w, 12 miles northeast of Ruston. No commercial showings were indicated on electrical survey.

Claiborne Parish: Ohio Oil Company recorded a flow of 10.73 barrels of distillate without mud or water and 273,000 feet of gas on the most recent 24-hour test of G. W. Taylor Account P-1, 15-23n-8w, deep test in the Haynesville field. This test was from perforations at 9905-10,395 feet. Crews were preparing to test another sand from 9545-70 feet.

Caldwell Parish: Shell Oil Company has completed the killing of Louisiana Central Lumber Company 1, 21-15n-3e, which blew out of control several weeks ago and demolished the derrick. Crews are changing defective connections after which electrical survey will be run and drilling resumed. The well promised to open a gas or gas-distillate field. It is bottomed at 10,141 feet in an unidentified formation.

Atlantic Refining Company may go to 9500 feet in its new wildcat, Louisiana Central Oil & Gas Company 1, 5-11n-3e, which will spud this week.

Catahoula Parish: Sinclair Prairie Oil Company is drilling below 3450 feet with no showing of oil logged at Gabe Fisher 1, C NE NW 26-9n-6e. The well entered the Wilcox at 3090 feet. A core from 3093-31-3 feet returned 7 feet of sand and sandy shale with no indication of oil.

☆

DR. SIDON HARRIS, seismograph supervisor for the Stanolind Oil & Gas Company in the Fort Worth division, resigned to organize the Southern Exploration Service with headquarters in the Sinclair building, Fort Worth. He was with Humble Oil & Refining Company's geophysical department prior to joining Stanolind in 1934.

MURRAY S. HITCHCOCK, sales engineer in the Birmingham district for American Meter Company, Erie, Pennsylvania, has been appointed assistant chairman of the Anti-Tank Mine Container Committee, M153, Industry Integration Committee, by the chief of ordnance. The committee comprises twenty-four manufacturers located in Nebraska, Michigan, New York, Pennsylvania and North Carolina.

Arkansas

State's Major Activity Centers in Union County

Root Petroleum Company's new Union County Smackover lime discovery, Union Saw Mill Company 1, Strong area, C NW NW 27-18s-12w, was swabbing 3½ barrels of 35-gravity oil on latest test after reperforating from 6319-29 feet. No formation water was reported.

McAlester Fuel Company was ready to take official test at Wilson-McRae 1, C NW SE SW 28-16s-18w, the second gas-distillate producer for the Salem Church field. The new producer was flowing 111 barrels of distillate through 13/64-inch choke on tubing from perforations at 6966-78 and 6998-7010 feet. Previously the well had trouble with salt water coming from the Smackover lime. Tubing pressure was 1900 pounds and gas-oil ratio was estimated at 21,000/1.

A delay was ordered by the Arkansas Oil and Gas Commission for fixing rules and regulations for the field. The Carter Oil Company, which brought in the discovery well, Wilson 1, had previously requested 320-acre spacing.

McAlester has staked location for McRae 1, C SW SE 16-16s-18w, 2 miles north of the Salem Church field, which also will seek production from the Smackover lime.

Marine Oil Company may drill another test in Twp 17s-15w, north and west of their Ezell 1, 13-17s-15w, recently abandoned in the Smackover lime.

Pope County: Arkansas - Oklahoma Gas Company is ready to abandon J. C. Tipton 1, 29-10n-24w, wildcat in the Clarksville area which has gone to 4050 feet without indication of production and is shut down awaiting orders.

Stanolind Oil & Gas Company has reached 4170 feet and is again fishing for tools in G. B. Maxwell 1, C SE SE 18-8s-18w, which is being drilled with cable tools.

Arkansas-Louisiana Gas Company is at 6112 feet and reaming down to straighten crooked hole at S. M. Hudson 1, 15-10n-24w, deep wildcat in the Clarksville field, whose objective is the Arbuckle lime.

Southeastern

Lamar Test May Open New South Mississippi Field

Gulf Refining Company is preparing to complete C. V. Cooper 1, southwest corner of Lamar County, which is expected to open a new oil field for Mississippi.

Casing was landed at 8950 feet after drilling to 9080 feet in sand, and perforations are being made opposite the location of water sands to isolate the water before starting production tests. Observers believe this well will produce, since it made a number of tests in the lower Tuscaloosa at the time it was being drilled, which showed plenty of heavy oil, in addition to a number of tests showing gas and condensate in the upper Tuscaloosa. It had one solid sand showing oil over a 116-foot section before going into water, and it is doubtless scheduled for the first test. Top of this sand was at 8723 feet and it was cored to 8839 feet, showing saturation

all the way. Sand also was recovered below this but carried salt water.

Shell Oil Company's Hibernia Bank & Trust Company 1, on the Tatum dome flank in the southern part of the county, is drilling below 8238 feet in the Tuscaloosa, which had been topped at 7034 feet.

Adams County: The California Company's Natural Gasoline Company 9, most southerly well in the Cranfield field, is preparing to perforate casing for completion in the Tuscaloosa sand after reporting a solid 100-foot saturated sand section, one of the best in the field. Total depth is 10,473 feet in sand and casing was cemented at 10,470 feet.

The Pure Oil Company's McDowell 2, wildcat south of Natchez, is drilling below 11,149 feet. A completion attempt will be made later in sands between 10,270 and 10,300 feet, casing having been set at 10,293 feet.

Jefferson Davis County: Gulf Refining Company's D. L. Mulkins 1, southwest of the Gwinville field, is drilling at 8582 feet in shale and sand with no tests below the one at 8119-40 feet, thought to be in the lower part of the Eutaw since Tuscaloosa has been reported at 8158 feet. The drill-stem test was open 5 minutes and recovered 1 stand of distillate and no formation water.

Superior Oil Company's Willie Durr 1, a mile east of Sid Richardson's Gwinville discovery, was drilling below 1440 feet in shale at latest report.

Jasper County: Gulf Refining Company has made location for a wildcat in southwestern Jasper County in its Edwards-Bailey Unit 1, in 27-10n-13w, scheduled to test the Tuscaloosa and Eutaw formations 18 miles southwest of nearest production in the Heidelberg field. This well is in wildcat territory but no dry holes have been drilled between this location and the field, and its structural position will be checked carefully.

Gulf is adding another producer in the field with its Morgan-McIntosh Unit 1 which flowed 50 barrels daily based on a 4-hour test from perforations at 5136-41 feet, but which will perforate other sections before final completion.

Yazoo County: Southern Natural Gas Company has made location for Gammill Investment Company 1, wildcat on a 25,000-acre block 9 miles west of the southern part of the Tinsley field. Location is in the southeast corner of southwest quarter of 5-9n-4w.

Florida

Activity was picking up in Florida though as yet there are no indications of important developments.

In Gulf County, The Pure Oil Company's C. C. Hopkins 1, 21-6s-9e, is drilling below 6905 feet, with no shows of oil or gas reported.

In Dade County, Humble Oil & Refining Company's State 1, C NE NW 30-55s-36e, was drilling below 7912 feet in anhydritea and dolomite. Humble was drilling at 528 feet in sand and shale at Gulf Coast Realties 4, 20-48s-30e, Collier County, after setting 26-inch conductor pipe at 63 feet. This is in the Sunniland area of the state.

Hunt Oil Company was drilling at 1295 feet in J. W. Gibson 3, 18-2s-11e, the third wildcat in Madison County.

Alabama

W. O. Woodward, Trustee, is building derrick for Mary Green 2, 31-11n-4w, Choctaw County, northeast of Mary Green 1, last reported testing through openhole from 2816-3500 feet, at a total depth of 2709 feet. Indications are that the Green 1 will be a commercial producer, though testing data is not yet known. H. L. Hunt will try to extend the Gilbertown field 1¼ miles southwest at M. W. Smith Lumber Company 1, C NE SW 11-10n-4w, where derrick is now going up.

Wilcox County: Southern Natural Gas Company has announced location for Fannie Stokes 1, C SW NW 32-12n-5e, on a block of 1500 acres, on a prospect which shows uplift on reflection seismograph work as well as surface relief. It will be a 6500-foot test. Nearest production is 45 miles west and 6 miles south in the Gilbertown field.

California

Notices to Drill New Wells Up 500 Over Last Year

The October 28 bulletin of the Division of Oil and Gas revealed that notices to drill new wells in the state totaled 1885 as compared with 1369 on the same date last year. At the close of the year more than 2000 wells will have been drilled.

Kern County: Standard Oil Company's KCL 20-13, 5-31-25, is drilling at 15,784 feet in hard cherty shale. Fifty-six feet more and the well will be 3

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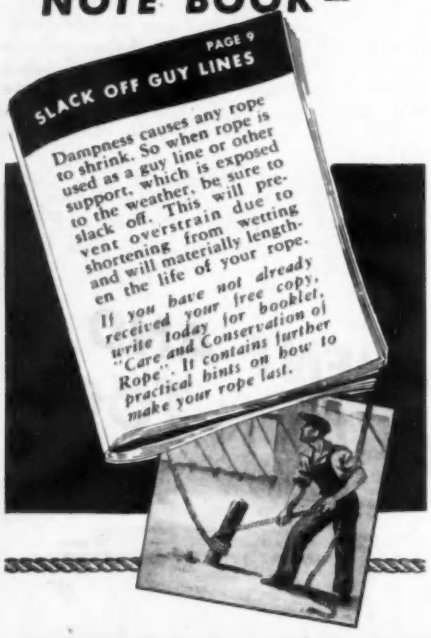
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miles deep. It holds the world record for depth.

Richfield Oil Corporation has located Old River-K.C.L. 2, Old River area, 990 feet south and 990 feet east from the northwest corner of 3-31-26. This is approximately ¼ mile from Old River-K.C.L. 1, which was abandoned at 9191 feet. Some oil sand was logged in the Stevens zone but tested wet.

Reserve Oil & Gas Company's 33-7, 33-11-19, Tejon Ranch area, is swabbing into the tanks at an estimated 100 to 150 barrels per day rate, 19-gravity oil, 1.2 cut (0.2 water and 1.0 emulsion). Casing pressure varies between 70 and 105 pounds.

Richfield Oil Corporation's Tejon C55-34 in 34-11-18, has 8⅝-inch casing cemented at 2566 feet and will make a shut-off test and core. Present depth is 2695 feet in oil sand. Top of main oil sand was placed at 2648 feet, and the top of gas sand at 2558 feet. A location is being graded for Tejon A 67-35, 2100 feet north and 1665 feet west from southeast corner of 35-11-19.

Los Angeles County: Tide Water Associated Oil Company's Standard-Sesnon 1-4, Aliso Canyon field, cored to 9150 feet in Eocene oil sand and is conditioning hole to re-run a formation tester. The first test with the packer set at 9060 feet failed. Top of the oil sand is tentatively placed at 9108 feet. This is an easterly offset to Standard Oil Company's Frew 1-2, which on a test of the Eocene sand at 9178-9290 feet, produced approximately 100 barrels per day of oil with some water. The well was later completed in the Sesnon zone.

Michigan

Less Importance Attached To Bay County Prospect

Shell Oil Company, Inc.'s field prospect in Bay County may prove far less important than was first indicated by the 50-barrel-per-hour Dundee discovery 2 months ago.

First test to follow the discovery, Shell's Kurzeja 1, SW SE SW 35-17n-4e, direct north offset 1320 feet, logged Dundee at 2843 feet or 24 feet lower than the producer, and at an even 2943 feet the well had not carried a show. Drilling was to continue but the discovery produced at 2900 feet. Shell has started a south offset and Smith Oil Company has spudded a test a half mile northeast on the Pateck 1, 80-acre lease that reportedly commanded a $25,000 cash payment and a 3/8 override. It was leased after the discovery well produced.

Allegan County—Raymond Donnersberger's Krubee 1, SW SE NE 8-3n-11w, Wayland Township, showed free oil at 1810-15 feet in the top of the Traverse for a prospective shallow pool opener.

Arenac County—Wicklund Development Company's State A-2, SE SW SE 6-19n-4e, Deep River field, flowed 65 barrels per hour after 500-gallon acid treatment from Dundee lime pay at 2861-75 feet. The test is 351 feet east of the State A-1, drilled last summer by Wicklund and junked as a Dundee failure, again demonstrating the inadequacy of 40-acre wide spacing patterns for narrow but prolific fields common in Michigan.

Illinois Basin

Franklin Discoveries Again Hold Spotlight in Illinois

Franklin County retained the spotlight in Illinois with its new discoveries.

Central Pipe Line Company's Rose 1, SE NE SE 4-5s-3e, swabbed 150 barrels of oil in 17 hours from McClosky lime at 2970-80 feet after 3000 gallons of acid. Operators were preparing to put the well on pump.

Sam D. Jarvis' Old Ben Coal Company 1, SE NE SE 29-5s-2e, approximately 2 miles southeast of Sesser, swabbed 5 barrels of oil per hour from Rosiclare and McClosky lime after the McClosky had been acidized with 1500 gallons. Operators were preparing to shoot the Rosiclare.

Jefferson County: The Texas Company believed it had a new oil strike at Inland 1, SE SW SW 25-4s-1e, a wildcat test 5 miles south of Waltonville. On a drill-stem test of Benoist sand at 2750-75 feet, the well showed 1000 feet of oil and 330 feet of oil-cut mud.

Hamilton County: In the Dale pool, The Texas Company was shut down at Davis 14, SE NW NE 7-6s-7e, a wildcat test for Devonian lime production. Repairs were being made at 4647 feet.

Bond County: The Texas Company has started operations at Miller 1, NWc 22-6n-6w, wildcat 2 miles northwest of Mulberry Grove, in an area long held as possibly productive.

Jasper County: Cherry and Kidd's Gray 1, NE NE SW 19-3n-12w, a pool opener 2 miles from the nearest production, initialed 20 barrels a day from Rosiclare lime at 2044-48 feet and McClosky lime at 2074-77 feet.

Kentucky

A pool opener is in prospect in south Union County at Farmer and Chenault's Slaton 1, 17-M-19. Operators are drilling plug after setting 7-inch casing to Hardinsburg sand at 1347-54 feet. On a drill-stem test, the well showed 50 feet of oil and 70 feet of oil-cut mud in 20 minutes.

Only wildcat completion in Kentucky was Bartmes-Pruitt's Willson 1, 17-N-23, which opened the Wanamaker pool in Webster County. The well had an initial production of 318 barrels of oil and 15 barrels of water in 24 hours from Tar Springs sand at 1908-20 feet, total depth.

☆

SPARLING B. ANDERSON, former president of Royden Drilling Company of Texas, a major in the United States Marine Corps, is commanding officer of the marine barracks, Naval Air Station, Elizabeth City, North Carolina.

WESTERN CANADA

Four-Weeks Production Test Of Princess Well Completed

California-Standard's Princess-C.P.R. 8, discovery Devonian lime producer on the Southern Alberta Plains, has an optimum rate of flow of between 200 and 250 barrels per day, producing through an 11/64-inch choke, according to official announcement following a 4-weeks' production test. Running with a casing pressure of 500 to 600 pounds

through this size choke, the well shows a gas-oil ratio of only 635 cubic feet per barrel. At this rate of flow, "the well shows no apparent decline in pressure."

During the test, the well produced 4824 barrels of 34.5-gravity crude oil, with water content of 1.35 percent, believed to represent drilling fluid only. Deliveries are being made to British American Oil refinery at Moose Jaw, Saskatchewan.

As a result of the Devonian strike an 18-foot section from 3965-3983 feet, about 1,000,000 acres have been taken up under lease or reservation within a 35-mile radius.

McColl-Frontenac Oil Company (Canadian affiliate of The Texas Company) and British Dominion Oil & Development Corporation have started their second joint venture on the South Alberta Plains. The new well, McColl Frontenac & British Dominion 14-34-8-7, has been staked in lsd 14 34-8-7w4th, Bullshead Prospect, geologized by McColl in 1943. The two companies jointly hold 20,661 acres covering the structure. The well is 24 miles south and 9 miles west of Medicine Hat.

Western Nova Scotia's First Drilling Is Begun

First oil drilling operations ever undertaken in the western section of the Canadian province of Nova Scotia are now under way at Kennetcook, in No. 1 well of the newly-organized Nova Scotia Oil & Gas Company, Ltd.

The company, headed by Samuel C. Nickle, veteran Calgary, Alberta, oil man, is financed partly by Nova Scotia capital and several of its officers are associated with United Service Corporation and subsidiary companies. The organization has drilling rights from the Department of Mines to 553,000 acres in Hants County.

A geological survey a few years ago by Professor Merle F. Bancroft of Acadia University, Wolfville, Nova Scotia, is the basis of the new venture. The operators hope to reach an extension of oil and gas bearing strata already tapped in the neighboring province of New Brunswick at Moncton.

Nickle says that his company will continue drilling even if the first well proves unsuccessful, adding that the entire area will be tested.

Harry W. Smith of Petrolia, Ontario, recently returned to Canada from drilling operations in Trinidad, is in charge of drilling. He expects drilling to progress at the rate of between 40 to 100 feet per day.

Canadian Concession

Sun Oil Company has been granted a concession by the Canadian government on approximately 500,000 acres in Cumberland County, Nova Scotia, adjoining coastal waters, and is reported having completed its geological work and is preparing to drill one or more wildcats next spring.

Indian Leases Offered

Sealed bids for oil and gas leases on restricted lands of the Five Civilized Tribes will be received at Muskogee, Oklahoma, up to 10 a.m., December 12. Leases offered are in Creek, Okfuskee, Hughes, Seminole, Pontotoc, Grady, McClain, Garvin, Stephens, Jefferson and Love counties.

U. S. Exploratory Completions

ARKANSAS WILDCAT

Hempstead County—Failure: Barnsdall Oil Co.'s M. Cox 1, c w½ ne sw 2-14s-26w, elev 260 ft, Massive anhydrite 2750 ft, Travis Peak 3430 ft, Smackover 5196 ft, abnd 5412 ft.

CALIFORNIA WILDCATS

Kern County—Failures: Beatty & Steele's 1, se sw 29-27-28, Mt. Poso area, Vedder 2320 ft, abnd 2345 ft.

Richfield Oil Corp.'s Cauley 1, se se 36-30-39, Mountain View area, Basement 1288 ft, abnd 1311 ft.

ILLINOIS WILDCATS

Clarke County—Failure: Grant Gallatin's Cole 1, sw sw sw 2-10n-13w, abnd 752 ft.

Cumberland County—Failure: Keating Drlg.'s Gibson 1, nw sw ne 9-10n-7e, abnd 2258 ft.

Effingham County—Failure: Frank Mitchell et al's Ruhull 1, se se sw 36-9n-6e, abnd 2561 ft.

Franklin County—Failure: E. S. Adkins' Peabody Coal Co. 1-E, ne ne sw 14-7s-3e, abnd 3047 ft.

Jasper County—Failure: Pure's Kauffmann 1, ne se se 27-6n-10e, abnd 2905 ft.

Jefferson County—Failure: Magnolia's Szramkowski 1, nw nw se 15-3s-1e, abnd 2459 ft.

Lawrence County—Failure: Clark C. Nye's Tracy 1, nw nw ne 4-2n-12w, abnd 2211 ft.

Lawrence County—Oil Discovery: Big Four Oil Co.'s Sumner-Griggs Comm 1, se ne ne 13-3n-13w, pump 22 bbls, 2022-43 ft, td 2049 ft.

Lawrence County—Failure: Ed Gieck et al's Price 1, se se sw 31-3n-12w, abnd 2069 ft.

Richland County—Failure: Pure's Gray 1, se sw se 9-4n-9e, abnd 3195 ft.

St. Clair County—Failure: Sinclair Wyoming's Baer 1, sw nw nw 23-2n-6w, abnd 2575 ft.

White County—Oil Discovery: Skelly's McCarty 1, ne ne nw 7-6s-10e, pump 17 bbls, Cyp sd 2695-2705 ft, td 3173 ft.

INDIANA WILDCATS

Parke County—Failure: C. C. Nye's Bartlaw 1, sw nw sw 16-16n-8w, abnd 1512 ft.

Posey County—Oil Discovery: Rodgers Cartage's Deacon-Lynch 1, se sw sw 25-7s-15w, pump 55 bbls McCl 2795-2805 ft, td 2850 ft.

Warrick County—Failure: A. J. Slaghter's Schrear et al 1, ne ne sw 34-4s-6w, abnd 1263 ft.

KANSAS WILDCATS

Greenwood County—Failure: R. W. Holcomb's Larson 1, swc ne 34-25s-9e, abnd 567 ft.

Sedgwick County—Failure: Beech Aircraft's Doyle 1, nw nw ne 5-28s-2e, Miss 3019 ft, Vl 3344 ft, Arb 3445 ft, abnd 3454 ft.

Trego County—Failure: El Dorado Rfg. Co.'s Benson 1, nw nw sw 21-12s-22w, Lans 3650 ft, Cong 4080 ft, Arb 4108 ft, abnd 4127 ft.

KENTUCKY WILDCATS

Crittenden County—Failure: Ryan Oil et al's Jenkins 1, 18-L-19, abnd 1482 ft.

Daviess County—Failure: Sinclair Prairie's Hancock 1, 6-O-28, abnd 2099 ft.

Henderson County—Failures: Ohio's Dossett 1, 5-P-22, abnd 2788 ft.

R. O. Gould Co.'s Pierce 1, 9-P-22, abnd 2645 ft.

NORTH LOUISIANA WILDCATS

La Salle Parish—Failure: Atlantic's Q. T. Hardner 1, 1080 w of nec 3-10n-2e, elev 125 ft, Wilcox 1568 ft, abnd 3993 ft.

Rapides Parish—Failure: Claude Morgan's Irene Wettermark 1, 24-5n-3w, elev 132 ft, abnd 7003 ft.

SOUTH LOUISIANA WILDCATS

Acadia Parish—Oil Discovery: Phillips' Onezime 1, Crowley area, 1653.7 s 11° 31 mins w of nec 16-10s-1e, perf 9738-41 ft, flow 33 bbls 47.5-gr, 2,520,000 gas, 11/64-in, gor 77,000/1, td 10,000 ft.

St. Mary Parish—Failure: Humble's Miami Corp. F-1, Black Crook Bayou area, start USCGS Station "Twin" on e shore W. Cote Blanche Bay go e 5119 th s 5281.5 to lcn in Bay T-15s-8e, abnd 12,041 ft.

Terrebonne Parish—Failure: Sun's Blanchard Pool 1, Humphreys Prospect area, 4469 s 500 w of nec sect 43-17s-16e, abnd 11,015 ft in shale.

SOUTH LOUISIANA OUTPOST

Vermilion Parish—W. Gueydan SE Flank Oil Extension: Pure's Ferguson-Benoit 1, 1008.5 n 330 w of sec sw 5-12s-2w ¼ mi s sw Magnolia's Hartwell 1, perf 17 shots 9619-23 ft, flow 213 bbls 36.9-gr, 120,000 gas, ⅛-in, td 10,806 ft, pb 9624 ft.

MICHIGAN WILDCATS

Allegan County—Failure: J. W. Lang Co.'s Kleinheksel 1, nw se se 22-4n-15w, Traverse lime 1503 ft, abnd 1534 ft.

Newaygo County—Failure: Sun Oil Co.'s Consumers 2, n½ nw se 16-16n-11w, Traverse 2630 ft, Dundee 3136 ft, abnd 3322 ft.

Bay County—Failure: Wicklund Development Co.'s Shudark 1, nw ne nw 31-14n-3e, Traverse 2960 ft, Dundee 3600 ft, so 3899 ft, abnd 4185 ft.

MISSISSIPPI WILDCAT

Tate County—Failure: E. R. Owen et al's W. D. Davis-F. F. Veazy 1, 11-4s-7w, elev 268 ft, artesian wtr 1500 ft, Midway 1400-1950 ft, Eutaw 2776 ft, Paleozoic 3000 ft, abnd 3025 ft.

NEW MEXICO WILDCATS

Eddy County—Failure: Texas Co.'s Skidmore 1, c sw sw 24-20s-31e, base salt 2125 ft, lime 2320 ft, 1st sul wtr 2498 ft, abnd 2935 ft.

Lea County—Oil Discovery: Gulf's Vivian H. Drinkard 1, c ne nw 30-22s-38e, 2½ mi e of Penrose fld, 1st Clear Fork prod for state, elev 3353 ft, anhydrite 1160 ft, salt 1253-2410 ft, Yates 2580 ft, San Andres 3950 ft, Glorietta 5130 ft, Tubb (Clear Fork) 6070 ft, flow 782 bbls 38.8-gr, gas-oil ratio 720/1, ¾-in tbg in 10 hrs, 5000 gals acid, Clear Fork perf 6375-6430 ft, td 6508 ft, pb 6465 ft.

OKLAHOMA WILDCATS

Beckham County—Failure: Northern Ordnance's Crawford 1, ne se 25-9n-22w, abnd 8222 ft.

Cleveland County—Oil Discovery: Deep Rock's Harris 1, ne nw ne 11-10n-1w, pump 58 bbls oil, 45 bbls wtr, perf 17 shots 5930-50 ft, td 6603 ft.

Grady County—Failure: Ohio's Hemphill 1, ne nw sw 18-5n-8w, March 6500 ft, Culp 6986 ft, Melton 7188 ft, abnd 7283 ft.

Jefferson County—Failure: Bridwell O&G Co.'s Smart 1, se se nw 13-7s-8w, Cong 2163 ft, abnd 2233 feet.

Kay County—Failure: Bridgeport Oil's Branine 1, ne ne se 14-29n-1w, Miss 3439 ft, Misener 3658 ft, Wx 3668 ft, Simp 3671 ft, abnd 3726 ft.

Lincoln County—Failure: R. L. Kemp et al's Long 1, se nw 15-16n-5e, Clev 2685 ft, Osw 3290 ft, abnd 3877 ft.

Love County—Failure: Sinclair Prairie's Donaghey 1, nw se ne 35-8s-2e, abnd 6429 ft.

Okfuskee County—Failures: Northern Ordnance's Graham 1, nw nw nw 8-11n-11e, Crom 3094 ft, Hunt 3684 ft, Vl 3810 ft, Wx 3861 ft, abnd 3882 ft.

Texas Co.'s Replogle 1, sw nw ne 33-12n-9e, Pitkin 3380 ft, abnd 3406 ft.

Pontotoc County—Gas Discovery: H. W. Shaw's Logsdon 1, ne nw se 32-5n-6e, flow 13,500,000 ft, perf 30 shots 1778-91 ft, td 1920 ft, pb 1880 ft.

Stephens County—Failure: Batson & Mullen's Selby 1, se sw nw 13-1n-4w, abnd 4002 ft.

OKLAHOMA NEW PAY TEST

Carter County—Graham Pool Discovery: Continental's Fowler 1-A, nw se sw 31-2s-2w, flow 2184 bbls 39.5 gr, perf 158 shots 5410-50 ft Hunton, pbtd 5470 ft.

WEST TEXAS WILDCATS

Andrews County—Failure: Champlin Ref. Co.'s University 1-B, sw ne sw sec 5, blk 11, elev 3338 ft, detrital 8050 ft, abnd (lse expired) 8536 ft.

Howard County—Failure: Ray A. Albaugh et al's Albaugh-McMurray (Stanolind) 1, c se ne T&P Ry. 29, blk 32, T-2-N, elev 2684 ft, Yates 1870 ft, lime 2960 ft, abnd 5010 ft.

Midland County—Failure: Richfield Oil Corp.'s Boone 1, c se T&P Ry. 44, blk 36, T-2-S, elev 2614 ft, abnd 4508 ft.

WEST TEXAS NEW PAY TEST

Pecos County—Fort Stockton Discovery: Humble's Williams 2, 2310 ft snl 1650 ft wel GC&SF Ry. 3, blk 114, 1st Delaware test for area, elev 2857 ft, Yates 2756 ft, flow 54 bbls 35.8-gr, natural, ¼-in, Yates 2794-2904 ft, td 3903 ft in Delaware, pb 2904 ft.

WEST CENTRAL TEXAS WILDCATS

Callahan County—Failures: Thos. D. Humphrey et al's Scott 1, 330 ft out nec of s-130 ac of 260-ac tr, SP Ry. sect 2, blk 1, abnd 3115 ft.

R. S. Miesse et al's Price 1, 220 ft snl 330 ft wel of lse, BBB&C Ry. sec 110, abnd 1402 ft.

Hamilton County—Failure: C. I. Production Co.'s Lund 1, 330 ft ne of nel Thos. Tatum sur, 330 ft nw of nel Peter Bailey sur, but in W. W. Trimble sur A-139, elev 1307 ft, Marble Falls 3227 ft, abnd 3237 ft.

Shackelford County—Failure: Hedrick Oil Co.-Jones-Stasney's Nail 1, 440 ft out swc sect 121, E.T. Ry. sur, elev 1714 ft, abnd 1312 ft.

Taylor County—Oil Discovery: Texas Co.'s H Sayles 1-C, 440 ft nsl, 990 ft wel labor 9, Sayles subdvn of Lge 122, W. R. Willis sur, 1⅝ miles n of Dunigan area, elev 1799 ft, pump 42 bbls, 2000 gals acid Flippen 2668-84 ft, td 2685 ft.

WEST CENTRAL TEXAS NEW PAY TEST

Jones County—Weaver Pool Deep Test:

Phillips' Touchstone-Weaver 1, 330 ft out of m/n/sw cor T&P Ry. 5, blk 17, elev 1723 ft, Dothan 1980 ft, Camp Colorado 2080 ft, Saddle Creek 2315 ft, Flippen 2362 ft, Upper Hope 2466 ft, Palo Pinto 4011 ft, abnd 4110 ft.

SOUTH CENTRAL TEXAS WILDCATS

Atascosa County—Failure: P. G. Northrup's Thornton Stevens 1, 1980 fr nl 660 fr wl I&GN sur 1747, abnd 1503 ft.

Bastrop County—Failure: Continental's Mikulenka 1, 1790 s of nl 380 w of el 98-ac lse William Barton sur, abnd 4300 ft.

SOUTHWEST TEXAS WILDCATS

Duval County—Failures: Edwin B. Cox-J. F. O'Neil, C. E. Yoakum-J. L. Hamon's Clara Driscoll 2, 330 fr nl 990 fr wl sect 44 Santa Rosalia Rafael Ramirez Gr, 3120-ac lse, abnd 2462 ft.

Fred Shield-J. W. Gorman et al's A. G. Black 1, 1047 fr nel 1645 fr nwl 180-ac lse, J. Poitevent sur 129, 12½ mi ne San Diego, elev 467.6 ft, Pettus 4790 ft, abnd 5019 ft.

Taylor Refining Co.'s E. A. Parr A-4, 1130 fr wl 475 fr nly nl 640-ac lse, sur 303, 5950 nw of A-20 well, ssg, abnd 5584 ft.

Starr County—Failure: Sun's Annie Reilly Est. A-1, 767 fr wl 3000 fr nl 332-ac lse, porc 97, 300 e and s of dry hole on same lse, abnd 5380 ft.

LOWER TEXAS COAST WILDCATS

Bee County—Failure: Luling O&G Co.'s W. E. Ruckmann 1, 467 fr se&nely swl 568-ac lse, 3107 fr sw 467 fr sel J. J. Sanchez sur A-296, elev 475 ft, sw ln Slick and Luling, Navarro 503 ft, Taylor 1630 ft, Slick 5926 ft, Luling 6054 ft, Massive 6212 ft, abnd 6315 ft.

Goliad County — Failure: Amerada's John Hoff et al 1, 660 fr wl 1795 fr sl 535.4-ac lse, Barton Peck sur A-239, 12 ne Goliad, abnd 10,792 ft.

Jim Wells County — Failures: Smith & Story's Alfred Ehrig 1, 330 fr el 2302 fr sl 213-ac lse, sur 88, 14 mi n of Alice, abnd 2786 ft.

Magnolia's J. R. Caldwell 1, 1980 fr s&wl 806-ac lse, Copita Farm & Garden Trs, lot 3, blk 1, 5 mi w of Lagloria, abnd 7294 ft.

LOWER TEXAS COAST NEW PAY TEST

Brooks County—Boedeker Gas Discovery: Sun's G. Boedeker et al B-1, 467 s of m/nly/int cor 3186-ac lse, CCSD&RGNG sur, blk 1, 16 mi s of Falfurrias, 1044 sw Sun's Boedeker-State gas well A-3, sand 6264-75 ft, perf 6260-65 ft, flow 2,445,000 gas, spray cond, ⅝-in, tp 1800 lbs, cp 1875 lbs, td 6611 ft.

TEXAS GULF COAST WILDCATS

Matagorda County — Failure: Hewit & Dougherty's J. J. Fortenberry 1, 660 fr s&wl 40-ac tr, sw 40 ac of J. J. Fortenberry 160-ac tr, I&GN sur, abnd 7553 ft.

Wharton County—Failure: Drilling & Exploration Co.'s T. W. Gresham 1, 330 fr n&wl sect 22, 239-ac lse, Otis Perrin sur A-474, abnd 6015 ft.

EAST TEXAS WILDCATS

Houston County—Failure: J. S. Ivy and W. T. Moran's Murray 2, 1980 ft fr m/w/el of 2000-ac lse, John Durst sur, 5040 ft ne of 9492-ft failure, elev 166 ft, Midway 4940 ft, Navarro 6410 ft, Pecan 6815-7185 ft, Austin 7462-7876 ft, Woodbine 7973 ft, abnd 8507 ft.

Navarro County—Failure: Ryan Consolidated Pet. Corp.'s Redford 1, 3200 ft fr sel 12,500 ft fr swl Hiram Bush sur, elev 360 ft, Pecan 1790-1958 ft, Austin 2624-3060 ft, Woodbine series 3485 ft, abnd 3608 ft.

NORTH TEXAS WILDCATS

Archer County—Failures: D. H. Bolin et al's Bill Threet 2-A, 150 ft out sec blk 106, Jefferson CSL, abnd 1137 ft.

Avis B. Taylor et al's Moore 1, 150 ft out nwc of n-60 acres of sec 57, blk 4, Clark-Plumb sur, abnd 1121 ft.

Frank Wood et al's L. F. Wilson 1, 330 ft out swc ATNCL sec 9, elev 1041 ft, Gunsight 1613 ft, abnd 4005 ft.

Cooke County — Junked: Phillips' Bailey Inglish-Eppie 1, 1650 ft snl 1320 ft ewl of J. F. Davidson sur A-336, elev 905 ft, conglomerate pay 2420-45 ft, schist 2508 ft, jkd and abnd 2510 ft after flowing oil.

Grayson County—Failure: Seitz-Comegys-Seitz-Humble's Walling 1, 330 ft out swc 400-ac lse and Sarah Cross sur A-210, Cretaceous-Strawn contact 1945 ft, Ellenburger 4210 ft, abnd 4388 ft.

Montague County — Oil Discovery: Continental's J. R. McNutt 1, ne se se sec 38, Burnett-McNutt and E.T. Ry. sur A-1069, 4⅛ mi sw Ketchum shallow pool, nearest, elev 1019 ft, Bend 5920 ft, Viola 6722 ft, Simpson 6749 ft, Ellenburger 7102 ft, flow 266 bbls 41-gr, natural, via 12/64-in fr Viola perf 6715-30 ft, td 7299 ft, pb 6950 ft.

Montague County—Failure: J. A. Chapman et al's Daube 1, 450 ft ewl 330 ft snl of 107-ac lse and Newton Kimbro sur A-405, elev 880 ft, Ellenburger 6504 ft, abnd 6710 ft.

Throckmorton County — Failure: Bridwell Oil Co.'s M. Richards 2, 2595 ft nsl 2585 ft ewl Andrew J. Morgan sur, abnd 563 ft.

WESTERN CANADA WILDCATS

Southern Alberta Plains—Princess: California-Standard Company's Princess-C.P.R. 8, lsd 16 21-20-12w4th, flow 250 bbls 34.5-gr fr Devonian li 3965-3983 ft, 11/64-in, td 3983 ft.

Hay Lake Nose: McColl-Frontenac-British Dominion's No. 12-17-1-17, lsd 12 17-1-17w4th, abnd 3366 ft, top of Madison lime.

NORTH LOUISIANA

Bossier Parish: H. H. Temple's Pirkle 1, 31-19n-13w, 3000-ft test, prep to mi.

Caldwell Parish: Atlantic's Louisiana Central O&G Co.'s 5-11n-3e, 9500-ft test, rur.

SOUTH LOUISIANA

Acadia Parish: Union Sulphur Co.'s Medlenka 1, 748 e 591 n of swc 11-8s-2w, Jota area, Chickasawhay test.

Lafourche Parish: California Co.'s Delta Farms Unit 2-1, Cut off area, start swc sect 60 go n 1° w 4669.9 th n 69° 4 mins e 4623.5 in 60-17s-21e, 12,000-ft test, dredging.

Livingston Parish: Louisiana Land and Expl. Co.'s Livingston Lbr. Co. 1, start m/ely/cor sect 45 go n 32° w alg el for 3300 th s 58° w 1980 to lcn in 45-7s-3e, lcn 10,000-ft test.

Rapides Parish: Louisiana Ld. and Expl. Co.'s Bentley Tr. 2, et al A-1, 3083 s 2420 w of nec 25-5n-3w, on 40-ac unit, Wilcox test.

MICHIGAN

Monroe County: F. T. Canon's Elconin 1, ne sw sw 1-6s-9e, rig.

Montcalm County: Ohio Oil Co.'s Sanborn 1, se ne ne 7-12n-8w, lcn.

Osceola County: Sun's State B-1, s½ nw ne 10-18n-9w, rig.

Gordon Oil Co.'s Weston 1, se ne ne 22-20n-8w, lcn.

Saginaw County: Maguire, Inc.'s Simons 1, ne se nw 22-11n-1e, rig.

MISSISSIPPI

Jones County: Ginther, Warren & Ginther's Florence Mitchell 1, sw¼ 23-6n-12w, lcn 9000-ft test.

Lamar County: Sun's F. M. Snowden 1, c nw ne 7-1n-16w, lcn 9000-ft test.

NEW MEXICO

Eddy County: P. B. English et al's E. C. Barton 1, se se ne 28-19s-31e, lcn.

Neil H. Wills et al's Wills-Federal 1-4, 330 ft out swc lot 14, or 2970 ft nsl and 1650 ft ewl 4-21s-24e, lcn 1300-ft test.

Rio Arriba County: R. S. Rhodes et al's John Sargeant 1, 2225 ft snl 737 ft wel 23-31n-3w, lcn.

Lea County: Gulf Oil Corp.'s T. R. Andrews-State 1, c nw ne 32-22s-38e, 1⅝ mi se of Clear Fork wildcat in process completion.

Lea County: Skelly Oil Co.'s E. L. Steeler 2, c ne ne 17-23s-37e, lcn for Clear Fork test for Skelly field.

OKLAHOMA

Creek County: A. D. Spears et al's Sowards 1, nw se sw 19-15n-7e, woc.

Creekmore-Rooney et al's Stone 1, se nw se 33-18n-9e, rust.

Grant County: Texas Co.'s Pierce 1, se se ne 32-29n-8w, woc 254 ft.

Love County: Samedan Oil's Haraway 1, ne se ne 31-6s-3e, c&p.

Osage County: Devonian Oil's Osage 1, se nw nw 28-29n-7e, lcn.

Payne County: Haddock & Dirrickson's Nelson 1, nw nw ne 33-18n-3e, dr 2435 ft.

Parker & Duerr's Maroney 1, ne se 1-18n-2e, dr 2735 ft.

Pontotoc County: Rhinehart & Pennington's McKeel 1, sw sw nw 36-3n-4e, rur.

Tillman County: Texas Co.'s Asenap 1, nw nw sw 25-4s-15w, lcn.

WEST TEXAS

Andrews County: Anderson-Prichard's University 1-30, se se se sec 30, blk 1, 2⅛ mi nw Midland Farms pool, lcn 5000-ft test.

Concho County: Mae Belcher-Clark-C. D. Neff's Will Loveless-Lockett 1, 660 ft out nec sect 10, L. M. Higginson sur, lcn 5500-ft Ellenburger test.

Ector County: Phillips' T. P. Land Trust-Phillips A-1, c nw nw T&P Ry. 21, blk 45, T-1-S, 1¾ mi se of prospective deep strike, lcn 10,000-ft Ellenburger test.

Howard County: Lilly Oil Co.'s B. F. McKinney 1, c se sw T&P Ry. 42, blk 30, T-1-N, 1 mi n by w of Iatan-East Howard field, lcn 3500-ft cable test.

Lamb County: Humble's R. L. Bagwell 1, 660 ft out swc labor 25, Lge 673, State Capitol Lands, lcn 7500-ft Ellenburger test.

Lubbock County: Seaboard Oil Co.-T.P. Coal & Oil Co.'s Nairn 2, c nw nw sec 25, blk A, 1 mi nw Lubbock pool's dormant disc, lcn 5500-ft test.

Martin County: Richfield Oil Corp.'s W. L. Clements 1, c nw sw T&P Ry. 22, blk 35, T-2-N, lcn 4250-ft San Andres test.

Terry County: Stanolind's Texas Land & Mortgage Co. B-1, c nw sw PSL sec 17, blk C-37, lcn 7500-ft Clear Fork test.

WEST CENTRAL TEXAS

Callahan County: Waldren Oil Co.'s H. W. Ross 1, 150 ft snl 450 ft wel BBB&C Ry. sec 97, lcn 1900-ft cable test.

Coleman County: Brookover & Burden's S. E. Weaver 1, 1565 ft snl 3302 ft ewl of J. C. Wofford sur 502, rig, 3600-ft test.

H. M. White & H. O. Newman's C. L. Gunn 1, 990 ft nsl 660 ft ewl HT&B Ry. sec 40, rig for 3800-ft cable test.

Hamilton County: C. I. Production Co.'s C. E. Lund 1-a, 50 ft se of 3237-ft jkd & abnd test, B. A. Carter and W. W. Trimble sur, lcn 4500-ft cable test.

Jones County: Dale H. Rowden, agent for R. Thomas McDermott's Lee McCaleb 1, sw

United States Wildcat Starts

ALABAMA

Choctaw County: Roland, Hamilton & Jarvis' J. W. Rudder 1, c sw sw 7-11n-3w, lcn.

ARKANSAS

Union County: Root Pet. Co.'s McRae 1, c sw se 16-16s-18w, lcn.

CALIFORNIA

Kern County: O'Kane & Brain's 1, se ne 20-25-26, Delano area, lcn.

Richfield Oil Corp.'s King 1, se sw 31-30-30, Edison area, lcn.

Tide Water's KCL 68-15, sw se 15-30-26, Gosford area, lcn.

Standard's 45-21, ne sw 21-29-29, Kern Bluff area, lcn.

Ada Oil Co.'s S.P. 9, nw sw 3-27-28, Mt. Poso area, lcn.

Sacramento County: Shell's Elk Grove 1, center sw 17-7-6, gas test Elk Grove area, lcn.

Solano County: Amerada's Church 1, ne nw 35-5-2, gas test, lcn.

ILLINOIS

Bond County: Magnolia's Hunter 1, nw nw ne 15-6n-3w, dr 287 ft.

Clark County: C. Collins, Tr.'s Wilhert 1, nw sw sw 31-9n-12w, lcn.

Clinton County: Texas Co.'s Althoff 1, se sw sw 29-1n-3w, dr 158 ft.

Fayette County: Texas Co.'s Swarm et al 1, ne sw 30-6n-3e, lcn.

Madison County: Texas Co.'s Ambuehl 1, ne ne sw 20-4n-5w, lcn.

Shelby County: Homer Luttrell et al's McAndrew 1, sw ne 15-10n-6e, lcn.

Wabash County: Paul Greauling et al's Case 1, se se nw 36-2n-13w, dr.

White County: B. M. Heath et al's Delap 1, sw se se 6-7s-8e, lcn.

Williamson County: J. R. Browning et al's Hayton 1, nw nw se 32-9s-1e, dr.

INDIANA

Gibson County: Carl Miles' Thompson 1, sw sw 11-3s-12w, lcn.

Parke County: Craig & Phillips' Rohm 1, se ne ne 15-15n-8w, lcn.

Vanderburg County: Sun's Seib 1, ne nw se 22-5s-11w, dr 377 ft.

KANSAS

Barton County: Vickers' Steiner 1, ne ne se 34-17s-12w, lcn.

Cowley County: Mark Adams et al's Adams 1, ne nw 2-30s-5e, c&p.

Grallup & McNish's Fee 1, sw se nw 12-31s-3e, lcn.

Creekmore & Rooney's Secat 1, nwc 26-33s-4e, rig.

Texas Co.'s Ott 1, swc 8-33s-6e, dr 165 ft.

Zephyr Drlg. Co.'s Warren 1, ne ne sw 6-35s-5e, rur.

Ellis County: Bridgeport Oil's Sessin 1-A, se sw se se 15-11s-19w, c&p.

W. L. Hartman's Huser 1, swc 3-15s-16w, rur.

Finney County: Stanolind's Fidelity St Bk 1, cnw 34-26s-31w, lcn.

McPherson County: Amerada's Harmon 1, nec sw 8-18s-1w, lcn.

Ness County: Texas Co.'s Boyd 1, swc 24-19s-24w, lcn.

Reno County: Skelly et al's Theis Est. 1, sec nw 31-26s-4w, lcn.

Rice County: Continental's Adams 1, sw nw ne 29-18s-8w, lcn.

Saline County: Don Ingling et al's Wilson 1, nwc sw 12-16s-1w, dr 150 ft.

Stafford County: Maguire Industries' Hartnett 1, nec 34-23s-11w, lcn.

Maguire Industries' Trethar 1, se sw sw 12-25s-11w, lcn.

KENTUCKY

Christian County: B. G. Pratt's Lanthrop 1, 13-H-23, lcn.

Henderson County: Ashland O&R's Busby 1, 12-N-23, lcn.

Hopkins County: Kentucky Natural Gas Co.'s Brown Hrs. 1, 12-J-21, lcn.

Union County: Robbinson & Puckett's Dyer 1, 3-M-19, lcn.

Farmer & Chenault Slaton 1, 17-M-19, lcn.

Wm. Rooch et al's Proctor 1, 10-O-21, dr 277 ft.

nw nw MEP&P Ry. sec 5, lcn 2800-ft cable test.

Shackelford County: Eltex's May Davis 1, ne ne se T&P Ry. 30, blk 11, lcn 4700-ft Ellenburger test.

Stephens County: American Manufacturing Co.'s R. M. Rogers 1, new pay test, 800 ft out swc T&P Ry. sec 27, blk 5, lcn 4800-ft cable test.

Taylor County: Onyx Refining Co.'s C. A. Nease 1, 330 ft wel 1350 ft nsl of 200-ac tr, or 1100 ft snl 4000 ft wel E. Anderson sur 81, lcn 1800-ft cable test.

SOUTH CENTRAL TEXAS

Bastrop County: D. B. Key Oil Co.'s Barney Wright et al 1, 864 fr nl 2250 fr wl 263-ac lse, J. Sandifer sur, lcn 700-ft cable tool test.

Frio County: Highland Oil Co.'s N. M. Johnson 1, 467 fr n&wl 120-ac lse, M. A. Rumfield sur, lcn 2000-ft test.

SOUTHWEST TEXAS

Jim Hogg County: S. F. Hulbut-Gulf States Oil Co.'s J. Vela Pena 1, 330 fr nl 330 fr wl blk 10 M. W. White subdvn, El Pyote Gr, 80-ac lse, elev 720 ft, lcn 3500-ft test.

Webb County: R. F. Schoolfield's A. M. Bruni Est. 1, 2500 fr el 1568 fr nl 234-ac lse, J. Poitevent sur 471, elev 583 ft, lcn 1700-ft test.

LOWER TEXAS COAST

Brooks County: Standard of Kansas' B. G. de Garcia lse 1-5, Alta Mesa area, 1400 w 2200 s of se int cor of 2161-ac lse, 4513 n ne of de Garcia 4, elev 300 ft, lcn 9500-ft test.

Calhoun County: Lewis Lawlor's Frank Kabela 1, 467 fr sw&sel lse, Valentine Garcia sur, lcn 6500-ft test.

Golind County: Amerada's Ada O. McFadden et al 2, 3110 fr nwl 330 fr sel 2527-ac lse, Pedro Trevino sur, 4760 w sw of No. 1, lcn 11,000-ft test.

Jackson County: Humble's Four Way Rch. C-1, 660 fr n&el blk 21, Young Coleman sur A-13, on 1001.6-ac lse and 2nd subdvn Laward Farms, 1 mi se N. Laward field, 1 mi s of Maurbro, lcn.

Karnes County: Lewis Lawlor's Gus A. Johnson 1, 467 fr s&wl 150-ac lse in Carlos Martinez Gr, 5 mi sw Kenedy, elev 410 ft, lcn 6250-ft test.

Phillips' W. P. Belknap 1, 3000 fr nel 400-ac lse and Chas. Hynes sur, 7½ mi se Kenedy, lcn 8000-ft test.

Southern Minerals Corp.'s Joe Bartosch 1, 467 fr nw&swl 171-ac lse, Louis Manchaca sur A-5, 1 mi n of Falls City, lcn 5000-ft test.

TEXAS GULF COAST

Brazoria County: General Crude's Belle H. Wisdom 4, 330 nw of c 250 fr nel of blk 68, 840-ac tr Abraham Darst sur, Damon Mound area, lcn 3500-ft test.

Colorado County: Pan American Prod. Co.'s R. L. Williams 1, 1787 fr nwl 1787 fr nel sect 663 and sur, 11,000 ne of Winnie Poole 1 in Ramsey fld, lcn 9200-ft test.

Fayette County: Kennecott Copper Corp-Jack Frazier's H. N. Schwartz 1, 373 fr nel 310 fr sel 50.2-ac lse, ¾ mi due n of s cor John Castleman sur, 7000-ft test, ru.

Harris County: Sun's W. S. Swilley et al 1, 18,129.6 fr wl Victor Blanco 5-Lge Gr and 993 fr nl 2795-ac lse, lcn 9500-ft test.

Matagorda County: A. H. & C. L. Rowan's Louis LeTulle 1, 1420 at ra fr wl 3200 fr el 2476-ac lse, 467 s at ra fr road, 2½ mi w of Markham, Richard Graves sur A-42, lcn 9500-ft test.

Wharton County: General Crude's Security B&T Co.'s 3, 3580 fr nel 275 fr sel lot 8, blk 103, 1000 w of No. 2, 300-ac lse, S. Castleman sur 5, lcn 5500-ft test.

EAST TEXAS

Hopkins County: Vilkey & Griffith's Ira Cundiff 1, 560 ft n 620 ft w of m/s/se cor of 16-ac tr, or 330 ft w 550 ft n of nwc of S. Derrick sur A-285, but in S. Derrick sur A-250, 1¼ mi n Peerless, lcn Paluxy test.

Houston County: A. P. Simons and W. W. Graham's B. Willis 1, 719 ft fr nw 416 ft fr swl 27½-ac tr, or 1550 ft fr nel 1460 ft wel of E. W. Goolsby sur, 4 mi n by w Lovelady, lcn Wilcox test.

Navarro County: J. M. Russell et al's R. M. Hudnall 1, 1975 ft ne of sel 677 ft se of nwl 470-ac tr, 1975 ft fr swl 2425 ft fr sel Joseph Mayor sur, 9 mi n by e Corsicana, lcn 1000-ft test.

Cherokee County: Humble's New Birmingham Development Co. 1, Rusk pool new pay (Travis Peak) test, 2205 ft snl 2571 ft wel of 1121-ac tr and Levi Jordan sur A-28, lcn.

NORTH TEXAS

Archer County: Fine & Sisk Oil Co.'s Clara Ayres 1, 4040 ft nsl 4800 ft ewl of Michael Fanning sur A-128, lcn 1400-ft test.

S. F. Hutcheson et al's V. F. Veitenheimer 1, 150 ft ewl 750 ft nsl sec 60, blk 4, Clark-Plumb sur, lcn 1100-ft rotary test.

Grayson County: A. Lee Andree et al's Whiting Est. 1, 661 ft ewl 890 ft snl 50-ac lse, or 6000 ft snl 3950 ft ewl Daniel Dugan sur, lcn 3500-ft rotary test.

Wichita County: Guy J. Scholl et al's D. W. Riley 1, 1900 ft nsl 150 ft wel blk 95, Red River Valley Lands, lcn 1800-ft rotary test.

Young County: Thos. D. Humphrey et al's W. Williamson 1, 467 ft out sec TE&L Co. sec 609, lcn 5000-ft Ellenburger test.

D. W. Ross Drlg. Co.-Nu-Enamel Oil Operating Co.'s H. C. Wells 1, 330 ft snl 1536 ft wel TE&L Co. sec 734, lcn 5500-ft Ellenburger test.

WESTERN CANADA

Southern Alberta Plains—Princess: Empire Petroleum's Princess 1, ne lsd 7 11-19-11w4th, dr.

Conrad: California-Standard's Conrad-Province 55-33B, se lsd 11 33-5-15w4th, rigging.

California-Standard's Conrad-Province 55-21B, se lsd 11 21-5-15w4th, lcn.

Bullshead: McColl Frontenac-British Dominion's No. 14-34-8-7, lsd 14 34-8-7w4th lcn.

Central Alberta Plains—Lloydminster: Lloydminster Oils Producers' No. 1, sw lsd 12 10-50-2w4th, dr.

☆

ART EVANS of Tulsa is sales manager of the office opened in 706 McBirney Building, Tulsa, by The Empire Oil Field Machinery Company, Odessa, Texas.

DR. JUDSON L. ANDERSON of Johns Hopkins University, Baltimore, Maryland, addressed the Oklahoma City Geological Society at Oklahoma City University on "The Petroleum Geology of Columbia, South America." The meeting was under the auspices of the AAPG. Dr. Anderson has spent 12 years as a petroleum geologist in West Africa and South America.

☆

O. L. LEWIS of Jones & Laughlin Supply Company, has been appointed chairman of the ASME group conference to arrange a district meeting at Tulsa in April, 1945, which will be attended by delegates from Texas, Louisiana, Kansas, Colorado, Arkansas and Oklahoma. Lewis will represent the group at the December ASME national convention in New York City.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ About 28,000-acre block So. Ga. leases for sale. Send or come and investigate. Owners care box 364, Waycross, Ga.

■ One Cardwell Model R, Double Drum Spudder; One Fort Worth Jumbo C spudder. Tools complete and steel dog houses for both. Call 3846 or write Lesh Drilling Company, 210 South Main Street, Henderson, Kentucky.

■ FOR SALE: 1—7000 ft. Power Rig with Lee C. Moore Cantilever Derrick (Good rig for Miss.). 2—4000 ft. Power rigs with Lee C. Moore Cantilever Derricks. 1618 Maury Street, Houston, Texas. F-2904.

■ Pumping Units for Sale: 2 Jensens C-10 and C-14; 1 Ideal gear unit; 1 Large V-Belt unit with up to six ft. stroke. Will sell the above at attractive prices all in No. 1 shape, desire to move in this year's tax period. Box 237, Graham, Texas.

BLUE RIDGE FIELD—FORT BEND COUNTY, TEXAS

20 acre Blakely lease—4 non-producing wells about 3700' deep—4 derricks—3 tanks—pumping units—small steam drilling rig—Two 85 Hp. Broderick boilers—Steam pumps—85 Hp. Cardwell pulling unit and miscellaneous lease equipment.

BIG CREEK FIELD—FORT BEND COUNTY, TEXAS

Two wells on 10 acre Ahler lease—1 producing 18 barrels per day—two tanks—warehouse and miscellaneous lease equipment. Sale price to be approved by Federal Court at Houston on November 25, 1944.

TRANS STATE OIL COMPANY
616 Citizens State Bank Building
Houston, Texas

FOR SALE
New and Reconditioned Iron & Steel
VALVES
Tested and Guaranteed
LARGE STOCK OF FITTINGS
APEX IRON & METAL CO.
2204 S. Laflin St. Chicago 8, Ill.

HELP WANTED

■ Engineer or Physicist to engage in study of reservoir performance as related to physical properties with major oil company. Individual should have aptitude and background to enable the mastering of mathematical analysis of problems in flow of fluids. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 29, c/o The Oil Weekly, Houston, Texas.

HELP WANTED

■ Wanted water well drillers for capable tool and rotary drilling. Florida territory. Wages $1.25 per hour, 40 hour week, time and half for over-time. Unless you are well qualified, do not apply. Address: Box 31, c/o The Oil Weekly, Houston, Texas.

■ Oil field salesman for West Texas Territory. Thorough experience in Oil Well production equipment. Also Sales Engineer for Houston Territory. By company manufacturing control equipment for over 22 years. When apply state age, experience, education, etc. Address: Box 27, c/o The Oil Weekly, Houston, Texas.

■ The Eastman Oil Well Survey Company has a Field Sales and Service position open in the Texas Gulf Coast area. Applicant must have good knowledge of and be well acquainted in the oil well drilling industry in this area. Attractive salary. Expenses and car furnished. Please mail written application to Post Office Box 8128, Houston 4, Texas.

■ **WANTED: Salesmen for cable tool drilling equipment, preferably men with some drilling experience. Salary and commissions with traveling expenses paid. Permanent position. Give age, experience, education and references as well as history of employment for past ten years. No references will be contacted without your authority. Address: Box 21, c/o The Oil Weekly, Houston, Texas.**

■ Chemical Engineer to engage in research and development work with major oil company along crude oil producing lines. Would include some field work. Recent graduates of interest. Position offers good future. Give full personal data, experience, and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 30, c/o The Oil Weekly, Houston, Texas.

■ Research Geophysicist with several years experience preferably including field work and laboratory work, to engage in research geophysics with major oil company. In charge of work including evaluation of new ideas and experimental development of same. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 28, c/o The Oil Weekly, Houston, Texas.

■ **WANTED: Experienced mechanical designing engineers by company established over fifty years. Increased demand for our products has created need for additional permanent engineering organization. Prefer graduate engineers with practical training in design and use of drilling and other machine products related to petroleum industry. Salary commensurate with experience and ability. State age, education, experience, record by consecutive dates for past ten years, references. No references will be contacted before personal interview. Address: Box 20, c/o The Oil Weekly, Houston, Texas.**

NOTICES

■ CAPITAL SEEKERS—Interested in raising $25,000 or more for a postwar project should writer to AMSTER LEONARD, Fox Bldg., Detroit 1, Mich.

Squeaks from the Bull Wheel

Poet's Nook

My love has went
He did me dirt
Me did not know
Him were a flirt.

And now, my friend,
May Heaven forbid
That you be dood
Like I been did.

Runs in the Family

"You're an apt boy. Is your sister apt, too?"

"If she gets a chance, she's apt to."

Breezy Answer

"Do you know Sally Rand intimately?"

"No, I'm just one of her fans."

Progress

"At first it was love. He fascinated me—and I kissed him."

"Yeah, I know. Then he began to unfascinate you—and you socked him."

Short Connection

A lady friend of ours who has two sons in the Marines and a daughter in the WAC was recently visiting a farm when she came upon a youth of draft age milking a cow.

"Young man," she demanded sternly, "why aren't you at the front?"

"'Cause there ain't any milk at that end, ma'am."

Louder, Please

"Aren't those chimes beautiful? Such harmony. So enchanting."

"You'll have to talk louder. Those damn bells are making so much racket I can't hear you."

The Braille System

"I'm groping for words to describe my love for you."

"Well, do you think I've got a dictionary tattooed on me?"

He Couldn't Win

It was a race between the stork and the ambulance and the stork won on the hospital lawn.

Eventually, the husband received a bill including the item: "Delivery room, $25."

He wrote a hot letter, insisting his wife had never been in the delivery room.

Back came another bill carrying a correction: "Greens fees—$25."

Class Dismissed

"F-e-e-t," the teacher declaimed. "What does that spell, Johnny?"

"I dunno."

"What is it that a cow has four of and I have only two?"

So Johnny told her.

Teetotalers

Jack and Jill fell down the hill,
A stunt that's mighty risky.
If water made them act like that,
By gosh, I'll stick with whiskey.

Swiss, Anyway

"That cheese you sold me yesterday—did you say it was imported or deported from Switzerland?"

A Cinch

"Darling, I got a beautiful parchment diploma from the cooking college today and I've cooked this for you. Take a bite and guess what it is."

"The diploma?"

Nice Try, Though

In the year 1700 the English parliament passed the following law: "All women of whatever age, rank, profession or degree—whether virgins, maids or widows—who shall, after this act, impose upon, or seduce and betray into matrimony any of his Majesty's male subjects, by virtue of scents, paints, cosmetic washes, artificial teeth, false hair, Spanish wool, iron stays, bolstered hips or high-heeled shoes, shall incur the penalty of the law now in force against witchcraft and like misdemeanors; and the marriage under such circumstances shall be null and void."

JOSEPH GORDON
Petroleum Consultant
Economic Surveys, Financing, and Price Adjustments
70 Pine Street — Whitehall 4-6494
New York 5, New York

HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Tex.

THE FORT WORTH LABORATORIES
Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138 823½ Monroe Street, Fort Worth, Texas

William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique
GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

Standco
NO-SMOKE
STANDCO BRAKE LINING
for the easiest brake known. It "feeds off" evenly. Standco never scores brake rims. See page 2808 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

Gott
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the jab. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today! . . . . . .
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
GOTKOOL WATER COOLER
Made in 2, 3, 5, 8, 10, 15 and 20 gallon sizes
KEEP PURE DRINKING WATER ALWAYS HANDY

Notes for the Equipment Buyer and User

Triplex Slush Pump
CLARK BROTHERS COMPANY

Clark Brothers Company, Olean, New York, has perfected a slush pump designed to give extra power for tough drilling. The power end of the pump is said to embrace many features which combine to give maximum power and durability.

The main herringbone gear is bolted to the hub integral with the crank shaft.

Power may be applied from either side of the pump through a double extended pinion shaft which is removable without disturbing the main gear assembly and operates on heavy-duty roller bearings.

The main shaft has eccentric hubs on the crank throws uniting all the advantages of both a crank shaft and an eccentric shaft. This design makes main bearings and connecting rod bearings interchangeable.

The pump cylinder is cast integral with a portion of the suction pipe which is welded to similar suction pipes on the other two cylinders. All cylinders are of the "valve over valve" construction type. Discharge and suction valves can be removed through one valve cover opening.

The pump is so designed that the fluid end can be produced either in the piston type or the outside plunger type.

Sales Managers Appointed By Beaumont Iron Works

Beaumont Iron Works Company, Beaumont, Texas, announced the appointment of C. J. Harris as domestic sales manager and Neil G. Nuttall as export sales manager.

Harris attended Texas A. and M. College and served in the first world war. In 1926 he joined the Beaumont firm and has since served as sales representative in the Beaumont and Houston districts.

Nuttall entered the company's service in 1920 and has served in various sales and executive positions.

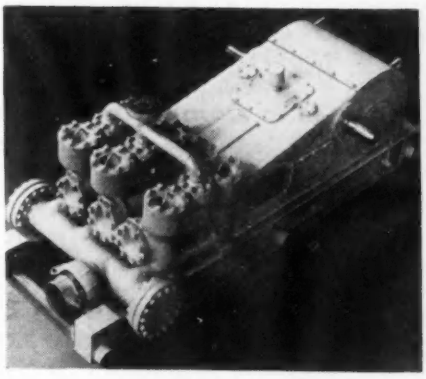
Grandson of Roebling's Firm Founder Is Named President

John A. Roebling's Sons Company, Trenton, New Jersey, announced election of Charles Roebling Tyson as president. He is the grandson of the founder and became associated with the company in 1935, working in various manufacturing departments. In 1940, he was made secretary and treasurer.

Lt. Joseph M. Roebling was named chairman of the board of directors. He is now abroad in the U. S. Air Corps. Archibald W. Brown has been named treasurer and H. D. Rathbun secretary and assistant treasurer.

Cutting Tools Catalog

Robert H. Clark Company, Beverly Hills, California, has released an adjustable cutting tools catalog illustrated with diagrams and photos of actual operations. A handy index and reference has been worked into the cover design.



Clark Triplex Slush Pump

Brass Division Sales Head Named by Kerotest Company

Kerotest Manufacturing Company has named George R. Allen general sales manager of the brass division.

Allen was associated with Mueller Brass Company as sales manager for eight years. He is secretary and a director of the Refrigeration Equipment Manufacturers Association, and was recently reappointed to the WPB general refrigeration and air conditioning committee.

Wins Maritime "M"

Ajax Iron Works, Corry, Pennsylvania, has been awarded the Maritime "M" for outstanding production achievement in war equipment. Ceremonies were held at the Ajax plant.

International Derrick Head Becomes Dresser Director

Dresser Industries, Bradford, Pennsylvania, announces election of Oscar M. Havekotte, of Columbus, Ohio, to the board of directors. He has been president of International-Stacey Corporation and International Derrick and Equipment Company, for the past four years and will continue as head of the latter company.

O. M. Havekotte

Dresser Industries has recently acquired the assets of International-Stacey Corporation, which will be dissolved, and of its subsidiaries, which will continue in operation.

Havekotte began his business career with Carnegie Steel Company. He rose to be assistant treasurer of Carnegie Illinois Steel Corporation, leaving that post in 1940 to assume his present position. He is a trustee of the Columbus Industrial Association and a director of the Petroleum Equipment Suppliers Association.

Wins Security Award

Brown Instrument Company, Philadelphia, Pennsylvania, has been awarded the National Security Award for outstanding wartime security measures.

Attend Security Engineering Parley

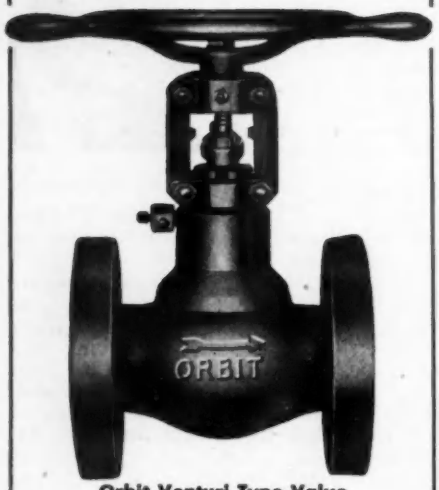
Twenty-six salesmen and eight servicemen attended the Security Engineering Company's five-day sales conference in Whittier, California. In the group, bottom row, left to right, are Jim Thompson, Centralia, Illinois; Karl Clark, Bakersfield; Hal Bentson, chief draftsman; Bob Gollum, New York; Gordon Newell, order department; Russell Smith, Odessa, Texas; Knight Templeton, Whittier.

Middle row: Percy Ellis, Coalinga; C. F. Johnson, manager valve department; L. G. Robinson, California sales manager; O. Hammer, vice president; R. M. Cook, general sales manager; Ken H. Swart, chief engineer; Floyd Wells, Whittier.

Top row: Clif Lowe, Whittier; Sam Gilliard, Ventura; Roy Tucker, Dallas; Clifford Ford, Whittier; Cal Shugert, Houston; Jim Campbell, Casper, Wyoming; T. H. Stancliff, engineering department; F. A. Parish, production manager, and Morey Zorgdrager, Houston.

SAND
VS.
WING VALVES

The **ORBIT VENTURI TYPE VALVE** is manufactured with Stellite "J" Metal Seats which will not only withstand the abrasion of sand but is also corrosion resistant to all types of crude oil.



Orbit Venturi Type Valve

This valve can be furnished thru all fabricators of Xmas Trees or thru any of your local supply stores at a price comparable to that of leading plug valves **YET** this valve requires no lubrication to effect a seal.

See 1944 Composite Catalog

ORBIT VALVES

OIL WELL IMPROVEMENTS COMPANY

TULSA **OKLAHOMA**

SERVICE REPRESENTATIVES

R. G. "Bob" Cole, Houston, Texas
Phone Fairfax 0057
Warehouse 1121 Rothwell, Sect. 15, Houston

Earl F. Warren, Phone 919-W, Alice, Texas

Rex E. Galloup, Phone 6436, Lubbock, Texas

Oklahoma Abandonments

A total of 86 wells were plugged and abandoned in Oklahoma between September 23 and October 26, including 52 dry holes and 34 exhausted oil and/or gas wells, according to a report of the Oklahoma Corporation Commission. Figures included 28 exhausted wells and 36 dry holes in the east ranges and 6 exhausted wells and 16 dry holes in the west ranges.

Texas Line Completed

An 8-inch, 16-mile oil line from the Seeligson pool in Jim Wells County to the Sullivan pool in Brooks County, Texas, has been completed for Sun Pipe Line Company, Beaumont, by Allied Welding and Engineering Company, Houston, sub-contractor from Anderson Brothers, Houston and Tulsa.

☆

R. E. SHAFER, and R. S. Henry have been named sales manager and purchasing agent, respectively, of The Wheland Company, Chattanooga, Tennessee, effective October 1.

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Secondary Recovery *Provides* MORE OIL FOR WAR

Complete practical experienced engineering service, including:

Preliminary Surveys
Gas Measurements
Bottom-Hole Pressure
Coring Equipment
Core Analysis
Water Treating Plants
Compressor Plants
Estimate of Results
Supervision
Installation
Operation

We invite your inquiries and would like to cite you references and show you actual performance records.

PETROLEUM ENGINEER
JO H CABLE
WICHITA FALLS TEXAS

WHERE CORROSION *is a Problem!*

Dresser Insulating Couplings break the flow of current between pipe lengths, prevent hot spots and electrolytic corrosion on the gathering line shown in the above photo.

•

Complete stock of "Dressers" ready at Dresser Houston Warehouse. Contact your distributor

PHONE: CHARTER 4-4723; L.D. 2107

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HOUSTON WAREHOUSE
1121 Rothwell St. Sec. 16, Houston, Texas